

**USAID/BOSNIA & HERZEGOVINA**

**WATER AND WASTEWATER SECTOR  
PLAN FOR INSTITUTIONAL STRENGTHENING  
TEN SELECTED PILOT VODOVODS**

**FINAL REPORT**

**6 OCTOBER 1999**

**The Ten Pilot Vodovods**

· Konjic	· Zenica	· Srbac	· Gradacac	· Bijeljina
· Cajnice	· Banja Luka	· Tuzla	· Orasje	· Celic

**Camp Dresser & McKee International (USA)  
Hydro-Engineering Institute Sarajevo (B&H)**

PLAN FOR INSTITUTIONAL STRENGTHENING



Bosnia and Herzegovina  
LOCATION OF TEN SELECTED PILOT VODOVODS

# SUMMARY

## I. BACKGROUND

Improvement of water supply and wastewater services was identified as a major priority among the programs selected as components for reconstruction of Bosnia and Herzegovina after the war. An ongoing program is being undertaken to assess the needs for reform of the sector at the national level. The objective of this program is to assess the situation at the local level. Ten vodovods throughout the country were selected by USAID to participate in a pilot program for strengthening the capability of these vodovods to provide satisfactory water and wastewater services to their customers in a business-like manner, that is, to become efficient and financially self-sustaining. Field visits were made to all ten vodovods, and physical, institutional and financial data were collected.

## II. NATIONAL SECTOR REFORM

Reforms are being evaluated in both the Federation and in Republika Srpska, the two Entities of the country. The logic and need for reform is so great that it appears inevitable. However, the process is expected to be time consuming, and not likely to result in the changes needed to provide vodovods with the greater autonomy they will need to develop into the type of utility envisioned in the goals of this program.

## III. EXISTING CONDITIONS

Administrative Organizations From the point of view of the vodovods, the municipalities (which are essentially districts) are the most important subdivision of the country. There are a total of about 134 municipalities, and each has a vodovod, or water and wastewater company. The vodovods are owned and firmly controlled by the municipalities.

Population and Persons Served The population of the country is about four million. Population estimates at all levels are unreliable because of the significant disruptions caused by the war. The total population of all ten municipalities in which the pilot vodovods are located is about 850,000. The vodovods serve an estimated 500,000 (59%) of this population with water and about 300,000 (35%) with wastewater services.

Sources of Water Eight of the vodovods use springs or wells for their major source of supply, and three use rapid sand filtration plants to treat all or part of their water sources. Most vodovods have an adequate supply of water, but there are deficiencies in three of the vodovods studied.

Water Quality and Testing Water quality is suspect, and in some cases it is clearly unsatisfactory. Cross contamination is a threat because of aging pipelines, occasionally marginal chlorination, and the lack of water under pressure 24 hours per day in at least three of the vodovods. Water quality testing is unfocused, unregulated and of doubtful reliability.

Water Metering Only half the vodovods have some metering on their sources of supply. Eight vodovods meter most of their customers' connections but only three reported that over three fourths of these meters were operable. Two vodovods reported that less than half their installed meters were operable, while the remaining five had few operable meters.

Water Consumption and Unaccounted-for-Water (UFW) The three systems that had reasonably effective metering of sources and customers reported average per capita water use of from 175 to 280 lpcd (with an average of about 215 lpcd), and UFW rates of from 41% to 54%. For the eight vodovods for which some estimate of the amounts of water produced were available, per capita production ranged from about 250 to 470 lpcd. Another consultant conducted a study of water use in Zenica for several days by 136 customers in single family dwellings and apartment buildings. Actual water consumption was similar for both types, and was about 200 lpcd. This is similar to the average of 215 lpcd noted above.

Wastewater Collection and Treatment Sewers are generally old and in poor condition, and few vodovods have the equipment needed to clear blockages. Three vodovods have combined sewers (that collect runoff rainwater as well as wastewater) and two reported they have no sewers. None of the vodovods provide treatment for the wastewater they collect. One has a relatively new treatment plant but it has been closed for about nine months because the municipality ordered it to be shut down to save on energy costs.

#### **IV. INSTITUTIONAL ASSESSMENT**

Organizational Structure for Provision of Water and Wastewater Services Five of the vodovods are “true” vodovods, companies with responsibilities for providing only water and wastewater services. Another also was responsible for solid wastes. The remaining four were communal services companies, providing responsibility for such services as solid wastes, street cleaning, public heating, maintaining public buildings, tending parks and cemeteries, and other services.

Relationships with Municipalities and Limits on Autonomy All vodovods in the study report to a municipally appointed and controlled board of directors, and the vodovod managing directors are appointed by the municipality. Among the several potential and actual problems resulting from this lack of autonomy are: (1) qualifications of the vodovod managing directors may be secondary to political considerations, (2) the financial viability of the vodovods is secondary to political interests, and (3) municipal officials sometimes interfere directly in the vodovods’ operations.

Internal Organization, Management and Administration Most vodovods would benefit from a more logical form of internal organization. Management capabilities were difficult to assess because the lack of autonomy and the deficiencies discussed below adversely affect the entire process of management. Administrative and management capacity is also impacted by poor organization of department functions, unclear identification of duties and responsibilities, inadequate data-gathering and reporting systems, and by a serious lack of office equipment and supplies.

Planning, Studies and Mapping There is little evidence of master plans or feasibility studies. Such studies as were available appeared to be mostly capital investment plans unsupported by financial studies, with little regard for priorities or staging. Mapping capabilities were poor in most vodovods, and often they had only a large, single, out-of-date map on which some of the system facilities were noted.

Operation and Maintenance Procedures Few facilities had operation and maintenance manuals to guide the operators, but most systems are relatively simple, so this inadequacy is not overly serious. In general, supervising managers and operators seemed to be performing their operating functions acceptably. Preventive maintenance is generally lacking, and keeping up with the need for repairs is difficult under the financial constraints that exist in all vodovods.

Personnel The vodovods may be somewhat overstaffed, but not seriously. Little formal training is provided. Human resource development (HRD) functions such as periodic evaluations, goal-setting, incentives, training or other HRD functions are not practiced to any significant extent in most vodovods.

Availability of Information and Reporting There is considerable room for improvement in the data gathering and reporting process, as evidenced by the difficulties in obtaining basic information from most officers interviewed. Except for limited use in the financial departments, there was no evidence of computer-based data collection and reporting.

Customer Relations Almost universally, the vodovods' programs for dealing with customers is aimed at reacting to complaints, mostly regarding bills. A few vodovods had outreach programs, such as inserting information booklets in the bills or offering to help customers reduce leakage in their homes, but most offered nothing relative to positive programs for improving utility-customer relationships.

## **V. FINANCIAL ASSESSMENT**

Broad-Based Problems Financial assessment was complicated by the use of several different currencies (Bosnian convertible marks, German Deutsche marks, Croat kunars or Yugoslavian dinars). Other problems were the two separate accounting systems in the Federation and Republika Srpska, and the confusion or lack of clarity of some of the account categories. In one vodovod, for example, "calculated non-material" expenses amounted to 15% of the vodovod's total expenses, and "non-calculated non-material" expenses amounted to another 13%.

Financial Policies and Audits While most vodovods have financial policies, they are often opaque and subject to abuse. There appears to be no comprehensive, independent audits of their books or financial reports. Reviews by the "Financial Police" appear to be limited only to revenues collected.

Accounting Practices As noted, each Entity has its own accounting system, each of which is uniform for all public companies, but they are not designed specifically for water and wastewater utilities. This means that the vodovods are unable to record and report on their financial activities to the extent normally required for autonomous water and wastewater utilities.

The Role of Barter Bartering goods and services in lieu of cash as payment for bills was common in all vodovods. This practice serves a purpose where cash is limited, as receiving something tangible from customers is preferable to receiving no payment. However, there is no consistency in how such transactions are described, valued and entered into the books. This leads to potential abuse by accepting goods and services for personal purposes.

Financial Systems and Records Where vodovods provided other communal services, revenues and costs were not separately identified for water and wastewater services. In the case of the true vodovods, costs and revenues for water and wastewater services were also combined. Several vodovods were identified as having computer systems sufficiently old that they face serious Year 2000 problems. Only one vodovod had a reasonably adequate management information system. Most financial departments lacked the basic software required for financial analysis, including spreadsheet applications, word processing or data base applications. Only the largest five vodovods prepared budgets for fiscal year 1999.

Tariffs The vodovods use widely diverse tariff structures. Customer charges vary based on size of meter or type of service. Most charge a fixed rate per cubic meter regardless of the amount of water used, but that amount usually varied by type of customer. Industrial users are charged from 1.5 to almost 6 times as much per cubic meter as residential customers. Some charge a flat rate and some charge a rate based on the estimated number of customers per connection. Where there were no functioning meters, vodovods usually charge on the basis of an estimated rate of per capita consumption and number of persons served. To minimize complaints, estimated water usage is often set at levels well below probable usage. Based on an estimated water usage of 200 lpcd and four persons per family, monthly family bills for water and wastewater services in the ten vodovods range from KM 6 to 30 (\$3.50 to \$17), with a median of KM 10.7 (\$6) per month.

Meter Reading, Billing and Collections All vodovods read meters and send bills monthly to commercial and industrial customers. Residential customers, however, are billed only quarterly, sometimes semi-annually, and in one case, annually. Typically, meter readers also prepare bills and deliver them to customers at the time the meters are read. Bills usually only include the current amount due, but do not show the level of past unpaid bills due. The major problem cited by all vodovods was the failure to collect a satisfactory percentage of the amounts they billed customers. The average collection rate for all ten was 40%, and it ranged from 10% to the 82% achieved by Banja Luka, which aggressively pursues non-paying customers in the courts. The largest amount of the accounts receivable for almost all vodovods was attributed to the public sector customers: the military, hospitals, schools and other public buildings. Neither the municipalities nor any other Governmental agency is helpful in solving that problem.

Vodovod Expenses The terminology used in the vodovods' accounting systems relative to expenses is not always sufficiently descriptive to clearly identify all cost categories, and several use different categories of expenses. Nevertheless, some rough comparisons of expenses were made. On average, the vodovods major expense categories were personnel (29% of total costs), depreciation (26%), electricity (11%), materials (10%) and "miscellaneous" (16%, but made of many smaller cost items). Unfortunately, only 3.5% was spent on average for maintenance and repairs. However, individual expenditures varied widely. For example, electricity costs ranged from only 2% (systems with gravity water sources) to 24% (systems with extensive pumping). A major new expense for vodovods is the taxes charged them by their Entity governments. For vodovods in the Federation, they are subject to three taxes, essentially a water pollution (or "protection") tax (KM 2 per person), a water source "extraction" tax (0.1 KM per m<sup>3</sup>), and, in the Federation, a general tax calculated at 10% of the amount they bill their customers. In Republika Srpska, they charge only protection and extraction taxes, at a rate of KM 0.01 per m<sup>3</sup> each. These taxes were initiated at the start of 1999.

Vodovods Financial Condition Even if the ten vodovods studied had collected all the amounts billed, six of the vodovods would still be reporting losses, while the remainder were in essentially a break-even situation. The fact that, on average, they collected only 40% of the amounts billed last year, means all vodovods are in very poor financial condition. The five basic financial indicators listed below were used in the study to determine their financial condition:

- ☐ Cash Flow None of the vodovods had sufficient cash flow to support routine operating activities or to conduct maintenance at the level required.
- ☐ Accounts Receivable Banja Luka was the only vodovod with an acceptable level of collection of their accounts receivable.
- ☐ Liquidity Zenica was the only vodovod with sufficient liquidity to remain solvent after meeting all short-term debt obligations.
- ☐ Profitability None of the vodovods are profitable, and most are seriously in debt.
- ☐ Accounts Payable Banja Luka, Zenica and Bijeljina have accounts payable averaging less than 35 day. All the others exceed that period, and several exceed it significantly.

## **VI. Private Sector Participation**

Government and Donor Views on Private Sector Participation The Government has indicated a strong interest in pursuing privatization of the sector. As a matter of policy, USAID, the World Bank and many other donors strongly support the concept of private sector participation as a viable and often preferred means of improving the quality of water and wastewater services.

Current Experience in the Country Five of the ten vodovods make use of the private sector in meeting some of their responsibilities. Zenica has contracted for the provision of its meter replacement needs, the maintenance of its accounting system and the development of an information system. Banja Luka uses private legal services to take its non-paying customers to court. Tuzla used outside expertise to develop a computerized system monitoring program, and outsources its construction repair work. Konjic subcontracts the maintenance of its computers used for financial purposes. The Municipality of Celic has selected two private firms for the provision of all municipal public services, but that program is not a useful example, given its present problems and small size.

Possibilities for Private Sector Participation in the Country There are several possibilities among the private sector alternatives that might usefully be applied among the ten pilot vodovods, or elsewhere in the country. The most comprehensive is the use of a *management contract*, under which the municipality maintains ownership of the sector assets, but contracts with an experienced company to operate and maintain the entire utility. The World Bank is considering such an option in Mostar, and some of the larger vodovods in the pilot study might be candidates for this type of program. All vodovods should consider the use of *service contracts* with private sector companies for the provision of a wide variety of functions. These would include those functions that the vodovod finds difficult to perform, or functions that the private sector may be able to provide more efficiently and economically. In addition, the Government may wish to consider undertaking a study to determine the economic and other advantages of developing the capacity for the local manufacture of meters, chlorine gas or other sector commodities.

## VII. RECOMMENDATIONS

General The report presents recommendations for institutional and financial strengthening separately in Chapters VIII and IX. In each chapter, these recommendations are divided into priority and other recommendations. Finally, broad recommendations for the entire sector, as opposed to individual vodovods, are also presented in Chapter VIII. For convenience, both institutional and financial priority recommendations are combined in this summary.

### Priority Recommendations

#### 1. Increase the Autonomy of the Vodovods (First Priority)

**Recommendation:** Municipalities should grant greater autonomy to vodovods through formal legal agreements between the parties.

Even with supportive efforts by the donor community, it must be recognized that it will be some time before comprehensive national sector reform and the concomitant granting of autonomy to the vodovods can be expected. The provision of greater autonomy to vodovods cannot wait if the proposed strengthening measures are to have the intended effect. It is recommended that, until sector reform is achieved, the donors make it a condition of any future programs of assistance that the subject municipality and vodovod enter into a legal agreement which provides the vodovod with increased autonomy to the extent permitted within existing laws and regulations. It is further recommended that a study be undertaken that would investigate this matter, and develop a suggested form of agreement that could be used for this purpose.

#### 2. Increase the Rate of Revenue Collections (Second Priority)

**Recommendation:** Undertake a multi-faceted program to ensure that vodovods collect most of the revenues which they bill customers. Elements of the program include:

- a. Adoption of an Aggressive Policy of Pursuing Outstanding Bills Like Banja Luka, other vodovods should use the court system aggressively to collect payments from delinquent customers. Initially, a clear collection policy should be established which sets forth the terms and penalties for non-payment, and it must be publicized and adhered to in order to ensure that customers know the vodovod is serious about payment. A specific payment period needs to be adopted and the date due placed on the customer's bill. Previous amounts owed should be presented on current bills so customers can see the total amount they owe. Commercial customers should be given two late payment warnings. The residential customer should be allowed three warnings. Shutoffs or court action should be initiated promptly once the last warning has been ignored.
- b. Development and Implementation of a Program to Facilitate Shutoffs As cited in the main report, there is a legal right for vodovods to shut off water to customers who are delinquent in their payments. FBiH Law on Public Utility Services (Article 11, Paragraph 2, Item 3) stipulates that the supplier of services may refuse to deliver services to those users who do not pay their bills for two consecutive months. Before the supplier cuts-off such service it must prove that it does not prejudice the rights of others who are paying regularly for their services. This condition protects the rights of people in apartment buildings who pay for their services from the loss of services in cases where a neighbor has not paid.



- c. Development and Implementation of a Strategy to Allow Vodovods to Refuse Service for Non-Payment Without Interference From Municipal Officials Ensure that this right is granted to the vodovods in the agreements with the municipalities recommended above. Develop a strategy to allow the vodovods to make use of these powers, and assist the vodovods in implementing that strategy. This strategy should include the drafting of a new “shutoff policy” which sets forth, within the law, the specific conditions under which the vodovod plans to exercise this power, and measures for the publication and explanation of this policy.
- d. Development of a Program to Physically Facilitate Shutoffs Make an inventory of all customer connections to determine either the location or absence of shutoff valves or other means of disconnecting the non-paying user, whether the valves or other means function, and whether the valves or other means of interruption can be protected against unauthorized reconnection by others. The first priority is to determine this information for industries, commercial facilities, public buildings and apartment or multifamily buildings.
- e. Implementation of a Program to Facilitate Shutoffs to Major Users Determine how best to implement the construction of any works required to facilitate shutoffs to major users. Estimate the cost of construction of the recommended shutoff facilities.
- f. Development of a Strategy for Dealing with Customers in Multi-Family Buildings Develop a strategy for simplifying the matter of billing and collections from multiple customers in buildings with a single meter. Determine the possibility of delivering a single bill to the owner of a multiple family unit with a single meter, or to tenant associations if the apartments are individually owned, rather than individual families in the building. That would shift responsibility for collection to the bills from the vodovod to the owner or association responsible for the building.
- g. Development of a Strategy to Pursue the Problem of Non-Payment by Public Customers Develop a strategy to assist the vodovods in collecting the amounts owed by the military and other public customers since the war. The vodovods should write off the outstanding receivables from public customers up through the end of the war, but the Government should honor its debts accumulated after the war, and pay them promptly. The alternative of passing these costs along to other customers is neither feasible nor fair. A government that aggressively pursues the vodovods for taxes imposed has an obligation to pay its own debts.
- h. Consider the Reduction of the Length of Time Between Billings Conduct a study to determine the added cost of billing more frequently, the potential benefits, and specific actions required to accomplish meter reading and billings on a more frequent schedule, at minimum additional cost. Currently, all vodovods bill their residential customers on a quarterly, semi-annual or annual basis. They also generally bill commercial and industrial customers on a monthly basis. Increasing the billing frequency for residential customers may improve collections by decreasing the amount of each bill, making it easier to pay when the bill is due. In general, it seems reasonable that those vodovods that now bill their residential customers on a semi-annual or annual basis should consider billing their residential customers on a quarterly basis. Those now billing quarterly should consider monthly or bimonthly billing. To reduce the extra labor entailed in increased billing, the meter reading procedure could be changed to permit reading meters on a cycle basis, or every other bill could be prepared on the basis of estimates rather than actual meter readings.

### 3. Implement an Effective Metering Program (Third Priority)

**Recommendation:** Undertake a multi-faceted program to ensure that vodovods develop effective metering programs that include the following:

- a. Source Metering It will be expensive to provide meters on presently un-metered sources, so this may need to be achieved over time. However, vodovods should improve their efforts to determine with greater accuracy how much water they are producing. This can be done with temporary measuring devices that can be moved from one location to another. Systems would also have to be developed to ensure that an accurate record of the daily hours of operation (of wells, for example) are maintained and reported to management. A study should be made (by local specialists, with overall guidance from an experienced expatriate) in each vodovod to determine how best to improve source measurement, and the recommendations of these studies could be provided to donors for their consideration.
- b. Metering of Large-User Customer Consumption Vodovods should ensure that the provision of reliable meters to larger users is made a priority. This includes every category of customers except those for small (one or two family) residential customers. Studies should be undertaken in each vodovod, with external assistance, to determine the status of metering for potentially large water users, and to conduct an estimate of the numbers and costs of required replacement meters, as well as a 20% reserve and a supply of spare parts.
- c. Metering of Small Residential Customers Providing meters for small residential dwellings should be established as having a relatively low priority. In the absence of any other measurement (such as basing consumption on the results of a previously operating meter), bills delivered to non-metered residential customers should be estimated on the basis of not less than 150 lpcd, and (in the absence of hard data) an estimated four persons per family. For those customers who strongly contest such estimates, a supply of meters should be made available for installation for a period of not less than six months, and future billings should be estimated on the results of the actual metering.
- d. Programs for Monitoring, Periodic Replacement, and Calibration and Repair of Meters Technical assistance should be provided to develop a general program for these areas of strengthening, which should then be tailored to suit the specific needs of each vodovod. Calibration, repair and rebuilding of meters probably would be more economically provided at a few regional centers, rather than trying to establish it at a large number of vodovods. There is already a good private sector capability for this at Zenica. The study should determine how best to expand this capability, with emphasis on doing so as a private sector activity. Monitoring and reporting of non-functioning meters could be improved immediately within existing vodovod capabilities. Removal and replacement programs would depend on the rate at which replacement meters could be made available.
- e. Programs for Prompt, Accurate Meter Reading and Transmittal of Reading Results One of the financial recommendations is for more frequent reading of residential meters, from the present schedules which range from quarterly to annually, to a proposed schedule of monthly or bi-monthly readings. Programs should be developed to assist the vodovods in meeting these objectives with minimum impact on staffing levels. These programs also should make recommendations to ensure efficient, prompt and accurate results throughout the entire sequence of meter reading, transfer of readings, and billing of customers.

#### 4. **Develop Demand Management and UFW Reduction Programs (Fourth Priority)**

**Recommendation:** Develop a general program for demand management and UFW reduction applicable to current conditions in the country's vodovods. Implementation to be undertaken by individual vodovods, with assistance to the vodovods as appropriate.

- a. Definition of Demand Management and UFW Demand management is a series of procedures or actions to assist the vodovod in reducing consumption and waste. The difference between the amount of water produced and the amount it can account for is referred to as unaccounted-for-water (UFW). Reasonable levels of demand assume that the utility provides only so much water as its customers need and are willing to pay for. For Bosnia and Herzegovina, a UFW level of 30% is believed to be a reasonable, achievable intermediate goal for most vodovods. Reducing UFW below that level would indicate excellent management.
- b. Components of Demand Management and UFW Reduction Programs Typical components of demand management and UFW reduction programs include: (1) reliable metering of both sources and customers, (2) assignment of responsibility and resources to locate illegal connections and either convert or eliminate them, (3) assignment of responsibility and resources for location and repair of as many system leaks as possible, (4) assignment of responsibility and resources for eliminating "administrative" losses, the tampering of the process of meter readings and or billings by dishonest employees within the utility for personal gain, (5) the establishment of step tariffs to make water more expensive as the amount of usage increases, (6) the implementation of water conservation programs, and (7) such other activities as may be appropriate in particular situations.
- c. Benefits of Demand Management Clearly it costs money to produce water, in terms of chemicals, energy, the capital cost of providing the capacity of pipelines, reservoirs, pump stations and treatment works, and the staff to maintain them. Water conserved frequently means that capital costs for expansion works to meet the demands of uncontrolled water use can be deferred. Water not wasted in buildings means reduced loads on wastewater systems, and similar savings in operating costs or deferred capital expenditures.

#### 5. **Develop and Implement an Effective Accounting System (Fifth Priority)**

**Recommendation:** Develop a model for and adopt a standard uniform chart of accounts to be used by all vodovods. Tailor the model accounting system for selected vodovods, and assist them in its implementation.

A uniform chart of accounts for water and wastewater utilities can consist of a single chart of accounts with totally separate accounts for the water function and the wastewater function. As an alternative, two separate uniform charts of accounts could be established, one each for the water function and the wastewater function. The chart of accounts can be adapted from international accounting organizations that have established accounts for water and wastewater, or from the uniform chart of accounts established by the National Association of Regulatory Utilities Commissioners (NARUC), a US organization, or a European counterpart organization

## **6. Develop and Implement an Effective Budgeting System (Sixth Priority)**

**Recommendation:** Establish a model budgeting process based on departmental functions and responsibilities. The model should provide for budget development, reporting, and tracking policies and procedures. Implement the process in selected vodovods so that the budgeting process can be adapted to their needs and integrated into computer based accounting systems.

Develop budgets by major department (financial, water sources, distribution) and require that budgeted costs be reconciled to actual costs at least quarterly. This will provide management with a tool that will track the vodovods' ability to keep within estimated expenditure limits and maintain an adequate revenue stream. Reporting by department will place the responsibility for meeting budget estimates with the head of each department. In most cases, if the department head receives timely reports, this will help the managing director to track expenditures and take any corrective actions that are necessary. The department heads should prepare a quarterly explanation for significant variances from budgeted line items. Management should approve these reports and present them to the vodovod Board of Directors for their approval and incorporation into the Board minutes.

## **7. Eliminate or Reduce Current Tax Burdens on the Vodovods (Seventh Priority)**

**Recommendation:** Pass legislation to eliminate or significantly reduce the magnitude of the taxes charged and the method of applying them, so as to achieve a more equitable system. In principle, a public utility providing such a life-dependent service as water supply should not be taxed. The donor community should assist in making this case strongly to the government. As a minimum, however, the FBiH and RS should change the basis of taxes applied to collected revenue as opposed to billed revenue. The magnitudes of the protection and abstraction fees or taxes should also be reduced to levels of KM 0.01 per m<sup>3</sup> each. The Federation tax of 10% on revenues should be deleted, since the RS has no such tax, or at least reduced to 5% as an interim step to dropping it entirely.

## **8. Establish More Realistic Tariff Rates (Eighth Priority)**

**Recommendation:** Develop a tariff model, and implement higher and more realistic charges for water and wastewater. Develop a model for general use by all vodovods, and modify and implement specific tariff schedules for selected vodovods. Develop a program to require governmental agencies to subsidize those unable to pay for water or wastewater services.

- a. Basic Tariff Rate Structure Where meters are available and functioning, the rate structure should have two components: a customer or fixed charge; and (2) a volume related charge. The customer charge can be a lump sum or can vary based on the size of the meter or type of service. The volume rate probably should provide for higher unit charges as volume increases. Where there are no meters, or no functioning meters, bills should be based on  
(1) recent bills during periods the meters functioned, or (2) for residential customers, assumed consumption of 150 lpcd and four persons per household. The tariff should incorporate charges for ancillary water and wastewater services provided to customers, such as (1) fire protection charges, (2) office service charges (late payment fees, collection fees), (3) connection and system development fees; and (4) field service charges (turn-off/turn-on, meter test).

- b. Obtain Government Support for Low or Fixed Income Families Establish a policy, with donor assistance, that lifeline or subsidized rates be set for low or fixed income customers. Reimbursement for these low rates should be provided by the municipal, canton or Federation/RS governments. This will improve payments by charging amounts that the customer can afford, and allowing recovery of the subsidized rates from those who have the responsibility for providing this needed social benefit. The lower rates for this new class of customers should be part of the proposed new tariff structures to be recommended for all vodovods.

## **9. Address Year 2000 Problems (Eighth Priority)**

**Recommendation:** Take action to avoid Year 2K problems. As the end of the year is so close, affected vodovods should take immediate steps, including engaging private sector expertise, to address this problem.

The vodovods Srbac, Tuzla and Banja Luka face almost certain Year 2K problems because of the age and type of their computer systems. There may be others with similar problems, and an assessment should be conducted to determine the extent of the problem in order to avoid the loss of customer records and interruption of billing and accounting functions.

## **10. Broad-Based Recommendations for Sector Strengthening**

- a. Develop a New Sector Support Organization Several vodovods have developed useful practices that could be used by other vodovods, but there is no formal means of exchanging such information. Similarly, the vodovods might be in a stronger position to overcome common problems if they could speak with a united voice. A study should be undertaken to make recommendations for establishing a sector support organization such as currently exist in the US and European countries.
- b. Conduct Studies of Income and Expenditures and Ability/Willingness to Pay Many officials believe that most people are too poor to pay for water and wastewater services, so prices should be kept low and people should not be pressed for payment. The availability of income/expenditures and ability/willingness to pay studies can provide data where none now exist, so such studies should be undertaken.
- c. Prepare a Program for Improved Water Quality Testing The report concluded that water quality testing is unfocused, unregulated, of doubtful reliability. In addition, unsatisfactory test results appear to have no effect on how the utilities operate their works. A specialist knowledgeable about the entire process of water quality regulation, testing and implementation should be engaged to provide specific guidance in this matter, basing recommendations on regulations and standards suitable for Europe.
- d. Increase Private Sector Participation A program should be developed to (1) identify those elements of the vodovods activities most likely to benefit from private sector participation, (2) prepare draft contracts for the provision of such services, and (3) prepare guidelines for the selection, payment and monitoring of any services contracted to the private sector.

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## APPENDICES

- A. Tuzla Vodovod: Regulations of the Board of Directors**
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## **LIST OF ACRONYMS**

AWWA -American Water Works Association

Bosnia - Government of Bosnia and Herzegovina

DIN – Deutsche Industrie Norm (German Industrial Standards)

Entity – The two highly autonomous divisions of Bosnia, FBiH and RS

EU - European Union

FBiH - The Federation of Bosnia and Herzegovina, an autonomous Entity of Bosnia

GIS - Geographical Information System

GoBiH - Government of Bosnia and Herzegovina

Government - Government of Bosnia and Herzegovina

HEIS - Hydro-Engineering Institute Sarajevo

IAS - International Accounting Standards

IASC - International Accounting Standards Committee

IFAC - International Federation of Accountants

km - kilometer

KM - convertible marks (currency in GoBiH); approximately \$1.00 = KM 1.75

l/sec - liters per second

lpcd - liters per capita per day

m<sup>3</sup> or M<sup>3</sup> - cubic meter

mg/l - milligrams per liter

MIS - Management Information System

NARUC - National Association of Regulatory Utilities Commissioners

OHR - Office of the High Representative (A United Nations function)

pH- relative acidity/alkalinity

PSP - Private Sector Participation

RBB - River Basin Boards and/or River Basin Bodies

RS - Republika Srpska (an autonomous entity of Bosnia)

SR - Socialist Republic (Former description of Bosnia when a part of Yugoslavia)

UFW – Unaccounted-for-Water

USAID - United States Agency for International Development

WTP - water treatment plant

Y2K or Year 2K- Year 2000

## **CHAPTER I BACKGROUND**

**1. Conditions Prior to Bosnian Independence** Prior to the war that led to Bosnia's independence, water and wastewater services were provided in accordance with the laws and practices of Yugoslavia. The sector was highly centralized and was operated in accordance with socialistic principles, in that sector services were heavily subsidized. The four-year war from 1991 to 1995 led to significant destruction and deterioration of sector facilities. It also caused major disruptions in operation and maintenance of sector systems, from both neglect and from extensive dislocation of population, including sector-operating employees.

**2. Donor Coordination and Support for the Water and Wastewater Sector** During the early stages of reconstruction of the newly independent country, the international donors agreed that rehabilitation of the water and wastewater sector would be given a very high priority. The international donor community prepared and supported an Emergency Water Construction Program, and the implementation of projects began in 1996. The donors formed an International Management Group (IMG) to coordinate the provision of assistance. The IMG then established a Water Supply, Wastewater, Solid Waste and Flood Protection Task Force, to which it assigned responsibility for coordination among donors providing assistance to the sector. The United Nations Office of the High Representative (OHR) is also an active participant in support of the water and wastewater sector.

**3. Donor Programs Related to Strengthening the Sector** Various donors agreed to fund a wide variety of emergency capital improvement and rehabilitation projects throughout the country, and these are described in the periodic reports prepared by the Sector Task Force. It was recognized at an early stage that fundamental reform of the sector would be required, both at the national and local levels. The European Union funded a study designed to assess and make recommendations for sector reform at the national level in the Federation of Bosnia and Herzegovina, and the Government of Finland funded a subsequent related study directed at the Republika Srpska. These studies are described in Chapter II. USAID commissioned this study of ten vodovods to assess the current conditions and make recommendations for strengthening the water and wastewater utilities at the local, municipal level. The objectives of this program are described in Chapter III.

## CHAPTER II STATUS OF NATIONAL SECTOR REFORM

### 1. Current Efforts at Providing Direction for National Reform of the Sector

- a. Background The first study of countrywide reform of the water and wastewater was commissioned by EU Phare, titled “Water Sector Institutional Strengthening in the Federation of Bosnia and Herzegovina”. That study, prepared by Plancenter Ltd. (Finland), BCEOM (France), and HEIS (Sarajevo, BiH) was completed in April 1999. A companion study, “Institutional Strengthening of the Water Sector in the Republic of Srpska”, has just begun. It is being funded by the Ministry of Foreign Affairs, Finland, and the lead consultant once again is Plancenter.
- b. Summary Recommendations of the April 1999 Report The report sets forth two main reasons for implementing reforms: (1) to overcome massive problems in the sector which are estimated to require KM 6.9 billion in improvements, and (2) to allow the GBiH to become a member of the European Union (EU). The report cited seven key recommendations, paraphrased as follows:
  - (1) Delegate sector responsibilities to the cantonal level, to the extent feasible
  - (2) Establish River Basin Boards (and Bodies) (RBBs) to facilitate inter-cantonal co-ordination, and to conform to EU practices
  - (3) Encourage delegation of sector tasks from the cantons to the RBBs so as to (a) integrate environmental and water matters, (b) permit co-ordination between cantons sharing river basins, and with counterpart RBBs in the RS, and (c) respond to EU-related obligations.
  - (4) Limit the responsibilities of the water management organizations (Vodoprivreda) to issues of ownership of water resources
  - (5) Limit the role of Ministries in the sector to policy setting and financial issues
  - (6) Adopt EU principles related to water management and administration, and
  - (7) Establish the principle that water utilities (at the municipal level) should be owned by the municipalities, but should be autonomous and financially independent
- c. Directions for the Companion Study for Republika Srpska The basic intent is to conduct a parallel study for Republika Srpska, with the goal of development and implementation of a new national sector policy that is essentially the same in both entities. Plancenter completed an Inception Report in August 1999 for the RS study. The inception report proposed four priorities for the study, paraphrased as follows:
  - (1) Define the role and responsibilities of the public sector in water management
  - (2) Organize water sector management activities of public enterprises on the basis of river basins
  - (3) Organize public enterprises responsible for water supply and wastewater services at the district level, and
  - (4) Establish a system for the administration of, and the assignment of responsibilities for (water sector activities) within the RS

## **2. Comments on Current Programs for National Sector Reform**

- a. Overview of Recommendations and Type of Reforms Proposed The reforms are based on European models, which stress allocation of responsibilities in accordance with areas defined by river basins. As one of the country's goals is to become more closely associated with Europe, this is quite appropriate. At this stage, it is also probably appropriate to treat the subject in the broadest of terms. The European model can be used to fill in the details later. The recommendations are a bit vague, however, on just what those ministerial responsibilities will be in "policy setting" and "financial issues". At the other end of the spectrum, there is quite a gap to be bridged between the current stifling control of sector utilities by the municipalities, and the recommendation that the utilities be "owned by the city", but also be "autonomous and financially independent". As all parties were to learn from the Dayton experience, the devil is in the details.
- b. Initial Reaction to the BiH Sector Reform Recommendations If implemented, the reforms would diminish the powers (and all the attributes that go with these powers) of some very important constituencies. These include some ministries, probably most municipalities, certainly the Vodoprivreda<sup>1</sup> (two offices in FBiH and one in RS) and quite possibly some political parties. Most of these parties appear to benefit from the status quo. The Vodoprivreda have been unenthusiastic from the start, as the reforms seriously diminish their role and the benefits they enjoy, and place them far from the very powerful position they had in pre-war days. Nevertheless, the donor community is well aware of the absolutely fundamental need for sector reform, and continues to be supportive of reform.

## **3. Assumptions on Implementation of Significant Reforms**

- a. Implications of Reform on Recommendations of this Report One of the major recommendations of this plan for institutional strengthening at the local level is to significantly increase the autonomy of the vodovods, and to help them become financially self-sufficient. Those are also the objectives of Plancenter's proposed reforms of the national sector, so clearly the implementation of real reform would be very beneficial. Based on initial reaction to proposed national sector reform, however, some agencies in the Government are not supportive of reform.
- b. Assumptions of the Eventual Implementation of Reform and its Timing The logic and need for reform is so great, and the consequences of failure to enact reforms are so dire, that reform appears inevitable. The importance of the donors to the country's survival, and the donors' commitment to reform lead to the conclusion that it will take place, but that the process will be time consuming. As a consequence, this report provides recommendations for strengthening the autonomy of the vodovods until national reform is enacted.

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<sup>1</sup> The Vodoprivreda are public water management enterprises. The Banja Luka organization is responsible for water management in Republica Srpska. The Mostar organization is responsible for water management for the drainage area of the Adriatic Sea, and the Sarajevo organization for the drainage area of the Sava River in the Federation. They receive most of the taxes the Government levies on the vodovods, and these funds are intended to be used for such tasks as water pollution control, water quality monitoring and flood protection. They are relatively small organizations and essentially are departments of the Ministry of Agriculture, Water Management and Forestry.

## CHAPTER III OBJECTIVES OF THIS PROGRAM

### 1. Background

- a. Prior USAID-Funded Sector Strengthening Project USAID recently sponsored a series of workshops for municipal and vodovod officials, to introduce them to basic principles of cost-recovery based financial planning, and computer-based cost recovery models. Over 60 vodovods, about half the total, completed the workshops by the end of May 1999.
- b. World Bank Program to Establish a Municipal Finance Facility The World Bank is currently planning the establishment of a facility that would make commercial loans available to qualifying municipalities. In the case of loans for water supply improvements, local vodovods would have to meet commercial credit standards in order to qualify for such loans. The Bank is willing to provide financial support to the vodovods to restructure and improve their financial and institutional capabilities, and also to create a regulatory framework for municipal borrowing.
- c. National Sector Reform The programs of national sector reform, described earlier, are fundamental to the success of institutional strengthening at the local level.

### 2. Overall Objective of the USAID Program

The overall objective is to strengthen the institutional and financial capacity of the vodovods to the extent required to achieve the financial sustainability and operational efficiency necessary to qualify for commercial credits from the World Bank or other lenders.

### 3. Specific Objectives of the Program

- a. Assess Existing Conditions The first objective of the program was to determine the existing conditions in the vodovods, based on the results obtained from field trips to ten vodovods, including basic administrative and physical conditions; and to assess the existing institutional and financial capacity of the vodovods.
- b. Recommendations for Improvements The next objective was to make specific recommendations for strengthening the institutional and financial capacity of the vodovods, and to consider the possible role of private sector participation in this strengthening.
- c. Action Plans for Improvements The final objective was to develop action plans for the implementation of the strengthening recommendations.

## CHAPTER IV SUMMARY OF EXISTING CONDITIONS

### 1. Administrative Organizations Within Bosnia and Herzegovina

- a. Major Components The country of Bosnia and Herzegovina, referred to as the “State”, has two major, highly autonomous “Entities” ( a term adopted in the Dayton Agreement): the Federation of Bosnia and Herzegovina (FBiH), and Republika Srpska (RS). Each has its own laws that impact the delivery of water and wastewater services, affecting most aspects of technical, administrative and financial matters.
- b. Cantons The Dayton Agreement also established the Canton as a new geo-political sub-division of the Entity of FBiH, but not for RS. FBiH was subdivided into ten cantons, containing from about four to eleven municipalities in each canton. The cantons also have their own governments, and they also impact on the activities of most vodovods.
- c. Municipalities and Populated Communities The terms municipalities, cities, towns and villages have different meanings in Bosnia and Herzegovina than is commonly understood in the west, and different forms of government. Arguably the most important subdivisions of FBiH and RS are the “municipalities”. Current information from OHR indicates that there are approximately 92 municipalities in the Federation and 42 in Republika Srpska, making a total of about 134. This number is approximate, and under frequent change. These totals do not include Brcko, which has been or is in the process of being transformed from a group of three municipalities into a single special district, under the jurisdiction of OHR. In the English language, a municipality is a general description for a populated area that could be a city, town or village. In Bosnia and Herzegovina, a municipality is more like a district, or county-like area, which frequently embraces one or more large population communities (“towns”), and often many smaller communities (“villages”)The municipality is a true geo-political subdivision, with defined borders and a defined governing body. A “Municipal Council” (or Parliament) governs municipalities. The voters of the municipality elect the members of the parliaments. They also have an executive body headed by a mayor. Municipalities are very important to the water and wastewater sector because they essentially own and control the vodovods. The status of the populated areas within the municipalities is less clear. At one time they were called local communities, and some had borders and governing bodies called community councils. However, that was before the war, and their current status is less certain. It does appear that the municipality has responsibility for the provision of public services to all the people within its borders, and the responsibility for the provision of water and wastewater services to all citizens within the municipal borders presumably now lies with the vodovods. However, the vodovods rarely provide such services to outlying communities. When the lines between FBiH and RS were drawn at Dayton, they resulted in a situation in which many municipalities lie partly in FBiH and partly in RS.
- d. Major Cities There are three officially recognized “cities” (roughly comparable to “metropolitan areas”) in the country: Sarajevo, which contains four municipalities; Mostar, which has six municipalities; and Banja Luka, which has only one. Unlike any other location in the country, the provision of public services in Sarajevo is directly the responsibility of Canton Sarajevo.

## 2. Population and Persons Served by Water and Wastewater Systems

- a. Unreliability of Population Data All information available on population levels is based on very rough estimates. The very substantial shifts of large segments of the population during the war has resulted in refugee-influenced increases and decreases in population, as well as changes of the composition of the populations of municipalities, even where the numbers remain reasonably stable.
- b. Populations and Service Areas During the interviews, questions were asked about the total population of each municipality visited, and the percentage served by piped water and wastewater systems. Service through public standpipes is very rare in the country. The “municipalities” are administrative divisions or districts that include several towns or villages, as well as the central city where the vodovod is based and to which it provides sector services. Presumably, the legal service area of the vodovods consists of the entire municipality. However, the actual “service areas” of most vodovods seems to include the central city of the municipality that controls it, and parts of one or several populated areas within the municipality. Some provide services to communities outside their municipality. Those populated areas may be contiguous or several kilometers away. They may be served by a single water system, or by several systems. To the extent feasible, an attempt was made to provide estimates for the following:
  - (1) Total population of the entire municipality (including all its population centers)
  - (2) The total population of the current, actual service area (the total population of all communities and populated areas that are served by piped water systems).

The population served by a wastewater collection system also was expressed as a percentage of the population of the water supply service area.

- c. Summary of Data Collected on Population and Served Population A summary of the results obtained on total population, and population served by the piped water and wastewater systems of the ten vodovods studied, is presented at the end of this chapter in **Table IV-1**.

## 3. Assessment of Water Sources, Quality, Facilities and Systems

- a. Type and Adequacy of Sources Springs and wells serve as the only sources for seven of the vodovods, and they are significant sources for two others. Sources appear to be adequate to meet current needs in eight of the vodovods, but are seriously deficient in Tuzla (which only operates from 6 to 8 hours per day) and Celic (which only operates about 12 hours per day). The situation in Konjic is more complicated. Flow appears to be abundant (spring capacity amounts to over 12,000 lpcd), but distribution piping may be the real limitation in the supply of water, which reaches the lower elevations of the town by gravity. Konjic serves only 60% of the population of the town and four surrounding communities, and the director said they only operate portions of the system 3 to 6 hours per day during the summer. The problem appears to be the cost of pumping water to the higher elevations of the town. Given its size and importance, the inadequacy of the water sources in Tuzla is of particular concern. Leakage and waste are believed to be very high in Tuzla, however, as they are producing enough water (yearly average) to provide 400 lpcd to their customers. **Table IV-2**, attached at the end of this chapter, presents a summary description of the water sources and other information about the water and wastewater systems.

- b. Water Quality Whatever the regulations may say, the practice of conducting tests of water quality is very haphazard. Most vodovods rely on local institutes of health for testing, but it seems as though their capabilities vary greatly. On-site laboratories, in the few vodovods that had any, were seriously deficient, and only one had some capacity to do limited testing for coliform bacteria. Others could test only for a very few parameters: pH, turbidity, residual chlorine, sometimes alkalinity, and conductivity, were about the limit of the capability of most labs. Sampling is sporadic and not very frequent. Twice monthly was about as often as anyone tested. Very few actual reports could be produced for inspection, and most of those contained such notations as “no problems found”, or a bacteriological test result that indicated the four tests were found to be “2 positive and 2 negative”, with no follow-up on actions required for failed tests. Bacteriological tests were performed by hospitals, a veterinary institute, and some health institutes. The Institute for Health in Dobož was said to be “licensed”, raising the question of whether many were not, or what licensing signifies. Several directors mentioned encroachment and increasing pollution of catchment areas as serious problems that had resulted in significant degradation of previously good quality water, even from mountain spring sources. In the only relatively complete test results seen (Orasje), iron in a large new well just put in operation was tested at 0.5 mg/l (the typical standard calls for not greater than 0.3 mg/l) but other tests were within the DIN (German) standards which they used for evaluation.
- c. Comments on Water Quality and Testing The quality of water which the ten vodovods is delivering to their customers is at best suspect, and in some cases clearly unsatisfactory. Cost constraints probably leads to cutting corners in chlorination; old and defective distribution piping (and, in three cases, less than 24 hour per day service) increase the risk of cross contamination. The complete lack of wastewater treatment contributes to polluted rivers that sometimes serve as another’s source of supply. Water quality testing is unfocused, unregulated, and of doubtful reliability. Unsatisfactory test results appear to have no effect on how the utilities operate their works. The system clearly needs a major overhaul. The Plancenter/BCEOM final report on Water Sector Institution Strengthening for FBiH, dated April 1999, assigns full responsibility for regulating the provision of water and wastewater services to proposed new River Basin Bodies (RBBs). Section 4.2.4.2 of that report (page 75) describes the RBB’s responsibilities and tasks, but does not specifically include the regulation of water quality in its list. Perhaps the intent is that such general terms as “regulation of water management”, or “monitoring and inspection” will embrace water quality issues. The FBiH Water Law adopted on 11 May 1998 may discuss water quality, but if so, it is lost in the flood of details covered by that law, and there is no table of contents or index to find it. Some specialists indicate that the legal requirements for water quality standards and testing are spelled out in older legislation.
- d. Treatment and Disinfection Only three vodovods provide water treatment, by rapid sand filters. The three, described below, were inspected as part of this study. **Gradacac** takes water from a lake impounded behind a dam, and it is the sole source of water. It is a fairly new (1997) plant funded by USAID. It has a capacity of 75 l/sec but is only required to operate at a rate of 65 l/sec. The plant is housed and consists of coagulation, laminar plate sedimentation, four pressurized sand filters, two activated carbon tanks, and chlorination. The activated carbon has not been regenerated (there is no capacity for doing so) or replaced in almost two years, so its effectiveness is probably limited at this time. The plant appears to be operating adequately. In the other two plants, the treatment plant water complements that from wells or springs. **Zenica** takes water from the Babina River, a tributary of the Bosna. Turbidity is a problem, and pre-sedimentation is required at the intake. It is an older plant, built about 1959, with a capacity of 190 l/sec. It has been



rehabilitated somewhat, and seems to be functioning adequately. **Banja Luka** takes water from the River Vrbas. The 600 l/sec plant was built in 1977, based on Austrian designs, and appears to function adequately. None of the well or spring water is provided treatment, although iron and manganese are problems in some locations. All ten water systems provide for chlorination of the water, but the level of adequacy is questionable. Most use granular forms for chlorine, which comes from Tuzla. This is a relatively inefficient means of chlorination. Chlorine in gaseous form is preferable, but is not now manufactured in the country.

- e. Distribution Reservoirs and Piping Most have some type of distribution storage, frequently coupled with booster pumps, as multi-pressure zones are common in this very mountainous country. Storage as a percentage of average daily water use is generally low, and there is limited use of elevated storage, largely because the hilly nature of most areas makes it unnecessary. Distribution piping is a weak link in the water systems of most vodovods. Much of the installed water mains consists of asbestos cement material and extensive use is made of galvanized iron for customer connections to the system. Leakage is believed to be high, and the number of repairs reported during visits varied from 20 to 200 per month, depending on condition and total length of mains. Many complained that they had no idea of where their valves are located, as records are poor and frequent repaving has occurred, without regard to raising the valve covers. The fairly high pressures resulting from the often significant differences of elevation within systems exacerbates the problem of leakage and breaks.
- f. Water Production The best estimates that could be made of water production for each of the vodovods are summarized in **Table IV-3**, attached at the end of this chapter. The notes to the table indicate that there are significant differences in summer (dry weather) and winter capacities for some systems. In other locations, the capacities of sources are greater than is actually produced. The relatively huge production rates for Konjic and Cajnice, compared to their needs, results from these being gravity-fed spring sources.
- g. Hours of Service **Table IV-3** also lists the hours of service, which is 24 hours per day for all but three systems. Tuzla (3-6 hours) and Celic (less than 12 hours) are limited by their inadequate sources. Konjic is not operating all parts of its system 24 hours per day because of the expense of pumping to higher elevations.

#### 4. **Assessment of Water Metering**

- a. Source Metering Half of the vodovods have no meters on their sources, and only three meter all sources. Where no meters exist, they estimate the flow based on pump nameplate capacity data and hours of operation, or other systems as appropriate. Despite the deficiencies in source metering, estimates of water produced are probably within about 80% accuracy.
- b. Customer Metering Metering of customers is seriously deficient among most of the vodovods studied. Eight reported being fully metered, one was half metered and one had only "some" meters. Only Zenica, Banja Luka and Bijeljina reported that more than 80% of their meters (all three were said to be almost entirely metered) were in reliable operating condition. Tuzla and Srbac (also "fully" metered) reported that less than half their meters function adequately. The remaining five vodovods stated that so few of their meters were operable that they didn't bother to read any of them except for larger users whose meters still functioned. For residential and others without meters, they either estimated their bills on the basis of a relatively low per capita water usage rate times the number of people estimated on the customers' premises, or charged a lump sum amount. **Table IV-3** at the

end of this chapter summarizes the conditions found in the ten vodovods relative to metering.

- c. Recognition of Importance of Metering Every official interviewed was eager to improve their metering situation, and all listed “new meters” as a priority need.
- d. Local Capacity for Repair, Rehabilitation and Calibration of Meters Relatively few vodovods had any capacity for repair and calibration of water meters, and where such capability existed, it was generally limited to the smaller sizes, and only a few meters could be tested at a time. The metering situation in Zenica is quite different, and is discussed in detail in the next paragraph.
- e. Metering Situation in Zenica All of Zenica’s estimated 8,100 customers are reportedly metered, and most are said to be in good condition. The consultant Plancenter’s pilot program in 1998/1999 covered 136 connections in Zenica. About 75% of the original meters in this test area were found to be in operating condition. As discussed previously, Zenica has an aggressive program of frequent field checking of meters, aimed at replacing defective meters with new or rebuilt units. Of Zenica’s total of about 8,100 meters, 4,000 have been changed in the 1995-1998 period (using meters provided with USAID funding), or about 1,000 (12%) per year. They plan to double this replacement rate in 1999, using rebuilt meters as discussed in the following paragraph.
- f. Private Sector Role in the Replacement Meter Market The Zenica vodovod has entered into an interesting arrangement with a private company based in Slovenia, “Jordan and P”. (The company has a working agreement with Mannesmann of Germany). This contract is for a period of ten years. Under the terms of the contract, Jordan provides Zenica with 1,000 rebuilt meters per year at no cost, and Zenica provides the space (and access to the Bosnian market) for the equipment and staff it needs to rebuild, repair and calibrate water meters of various sizes. The company has very impressive facilities in the vodovod’s building and a staff of eight workers (six locally, one in Slovenia and one in Austria). The arrangement has been beneficial to Jordan, permitting it to capture about 80% of the current total Bosnian market for replacement meters. They serve most of the needs of such cities as Sarajevo, Mostar, Tuzla and Bihac. They have rebuilt about 10,000 meters per year for the past five years and hope to increase this rate to 20,000/year by 2000.

## **5. Assessment of Wastewater Collection and Treatment**

- a. Collecting Sewers Sewers are also generally old, and generally given little maintenance until a blockage occurs. Very few vodovods have the equipment or capacity to deal with serious blockages. During the field visits, an irate customer stormed into a directors office and vociferously berated the director for a blockage that had occurred in front of his business – a blockage that had gone uncorrected for quite some time, apparently. Later the director noted that he had no easy way to correct such problems. The alternatives were to hire – at quite a high cost – a truck with a high-pressure pump from a distant vodovod, or to physically excavate, break into the pipe, manually remove the blockage, then rebuild the sewer and refill the excavation. As noted in **Table IV-2**, Bijeljina and Celic have no sewers, four systems are at least partly combined (meaning they carry storm water flows as well as sewage), and Cajnice has an antiquated system built largely of stones, that was under serious repair during the field visit.

- b. Treatment and Disposal Nine of the vodovods have no wastewater treatment at all, nor does it appear they ever had treatment. A new activated sludge secondary wastewater treatment plant was constructed in Gradacac with USAID funding. It is a relatively small plant with a capacity of 4,800 m<sup>3</sup>/day and it was placed in operation in the fall of 1998. It operated for about three months (“about 2,000 hours”) when the municipality ordered that it be shut down because of the high cost of electricity to run the facility. When it was shut down, flow was diverted to a nearby small river. The residual wastewater in the various tanks was not pumped out, nor were racks cleaned nor grit removed from its tank, nor was sludge removed. The results are not pretty. If the facility is not cleaned up, moving parts greased and the entire plant properly prepared for an extensive shutdown, it will not take long before it will become very difficult to put it back in service when the time comes to do so.

**Table IV-1**  
**Total Population and Population Served by Water and Wastewater Systems<sup>2</sup>**

Municipality	Population					
	Total Municipality	Central Town plus Others <sup>3</sup>	Served by Piped Water		Served by Sewers	
			Pop' n	Percent <sup>4</sup>	Pop' n	Percent <sup>5</sup>
Konjic	35,000	23,000	14,000	60%	7,000	30%
Caijnice	7,000	5,000	4,500	90%	3,600	72%
Zenica	145,000	100,000	91,000	91%	77,000	77%
Banja Luka	280,000	250,000	240,000	96%	132,000	53%
Srbac	24,000	13,300	11,000	83%	4,000	30%
Tuzla	150,000	140,000	130,000	93%	60,000	43%
Gradacac	45,000	16,000	15,000	94%	6,000	38%
Orasje	28,000	6,000	5,500	92%	5,000	83%
Bijeljina	120,000	84,000	75,000	89%	No sewers	0%
Celic	18,000	7,600	6,000	79%	200m of sewers	<5%
<b>Total</b>	<b>852,000</b>	<b>644,900</b>	<b>502,000</b>	<b>78%-59%<sup>6</sup></b>	<b>299,600</b>	<b>46%- 35%<sup>7</sup></b>

<sup>2</sup> Data are rounded, and represent the best estimate available on the basis of field interviews, data reported earlier by the 8 of 10 vodovods which attended the USAID Workshops for which they provided information, and follow-up phone calls to try to resolve contradictions or questionable data.

<sup>3</sup> Includes the estimated total population of the central town of the municipality (the principal town or municipal center), plus that of the other populated areas served by the vodovod's water systems.

<sup>4</sup> Percent of the estimated population of the central town and surrounding communities it purports to serve.

<sup>5</sup> Percent of the estimated population of the central town and surrounding communities it purports to serve.

<sup>6</sup> While the utilities serve 78% of their central town and nearby populated areas, they serve only 59% of the population of all the municipalities.

<sup>7</sup> The estimated total sewered population amounts to 46% of the population of the central town and surrounding populated areas, and only 35% of the total population of the ten municipalities.

**Table IV-2**  
**Summary Description of Sector Facilities**

Municipality	Water Facilities			Wastewater Facilities		
	Sources of Water	Treatment/Chlorination	Comments	Collection System	Treatment	Comments
Konjic	Springs	None Chlorination	5 systems 8 pump sta., HP zones	Yes Separate 9 km	None	To River Neretva
Cajnice	Springs Gravity fed	None Chlorination	Excess capacity	Yes (Old) Separate Stone Sewer	None	To River Drina
Zenica	Springs 2/3 WTP 1/3	Rapid sand Chlorination		Yes Separate (Mostly)	None	To River Bosna
Banja Luka	9 wells 4/10 Surcharged WTP 6/10	Rapid Sand Chlorination	Wells sur- charged by river water	Yes 50% Combined	None	To River Vrbas
Srbac	2 wells	None Chlorination		Yes Built 1980 Separate	None	To River Sava
Tuzla	5 springs 7 wells	None Chlorination	Sources inadequate for needs	Yes Partly Combined	None	To River
Gradacac	WTP served by lake behind dam	Rapid Sand Chlorination	3 reservoirs multiple re-pumping	Yes Mostly Separate	Yes <b>(See Note A)</b>	To River
Orasje	3 wells 1 new, 2 old	None Chlorination	Includes PS and hydro-pneumatic tk	Yes Combined	None	To River Sava
Bijeljina	8 wells plus 7 wells in clusters	None Chlorination	Booster PS Elevated Storage	None	None	
Celic	Deep wells Dug wells	None Chlorination	Two (soon 3 Separate systems)	None (only 200 meters)	None	

**Note A:** A new activated sludge wastewater treatment plant was built with USAID assistance, and was completed in autumn 1998. It operated for about 3 months and was ordered shut down by the municipality to save on energy costs. It has not operated since about the beginning of 1999.

**Table IV-3**  
**Metering, Water Production, Hours of Service and Connections<sup>8</sup>**

Municipality	Metering			Water Produced <sup>9</sup>		Hours of Service Per Day <sup>10</sup>	Number of Connections
	Sources	Customers		M3/Day Supplied	Liters per Cap/Day		
	Status	% Total	% Good				
Konjic	Some	Some	None	32,000	2,300	24 (Grv) <6 (HPr)	2,500 <sup>11</sup>
Cajnice	None	45%	None	18,600	4,100 <sup>12</sup>	24	860
Zenica	WTP	Most	>80%	43,000	470	24	8,100
Banja Luka	Yes	Most	>80%	82,200	345	24	19,500
Srbac	None	Most	<50%	4,300	390	24?	3,500
Tuzla	Yes	Most	<50%	52,600	405	6-8 hrs	17,000
Gradacac	Yes	Most	None	4,500	300	24	3,950
Orasje	Most	Most	10%	2,000 <sup>13</sup>	360/275	24	1,400
Bijeljina	No	Most	80%	25,500	340	24	15,000
Celic	No	Most	None	1,500 <sup>14</sup>	250/120	12 +/-	1,550

For three vodovods with reasonably reliable metering of sources and customers, unaccounted-for-water and per capita consumption, based on the amounts of water billed to all customers, was estimated as follows:

	<u>UFW</u>	<u>Per capita Use (Liters/day)</u>	<u>Water Billed</u>
· <b>Zenica</b>	<b>41%</b>	<b>280 lpcd</b>	<b>25,400 m3/day</b>
· <b>Banja Luka</b>	<b>49%</b>	<b>175 lpcd</b>	<b>42,100 m3/day</b>
· <b>Bijeljina</b>	<b>54%</b>	<b>185 lpcd</b>	<b>13,700 m3/day</b>

The per capita usage for Bijeljina was adjusted by increasing the billed amounts based on increasing estimates for the 20% without meters from about 100 to 200 lpcd.

<sup>8</sup> Data are rounded, and represent the best estimate available on the basis of field interviews, data reported earlier by the 8 of 10 vodovods which attended the USAID Workshops for which they provided information, and follow-up phone calls to try to resolve contradictions or questionable data.

<sup>9</sup> Data reported are estimated amounts produced. In some places, capacity exceeds the amount produced.

<sup>10</sup> For Konjic, water is provided 24 hours/day for gravity fed areas, and 3 to 6 hours/day for high pressure zones

<sup>11</sup> No data were obtained. Figure shown was taken from data provided at the USAID Workshop

<sup>12</sup> Konjic and Cajnice are served by springs with more capacity than required, and flow is by gravity. However, pipeline limitations are such that water available is considerably less than the amounts listed.

<sup>13</sup> Reported as 2,000 M3/day in summer and 1,500 M3/day in winter

<sup>14</sup> Production was 1,500 M3/day in 1998 but has decreased to 700 in the summer of 1999 because of dry weather.

## CHAPTER V INSTITUTIONAL ASSESSMENT

### 1. Variations in the Provision of Water and Wastewater Services

- a. True Vodovods vs. Communal Services Departments Water and wastewater services are now generally provided in municipalities either by a “Vodovod” (literally translated as a “water line”), a company that usually provides only water and wastewater services, or as part of a public utilities company in the municipality. In earlier years and in smaller towns, water and wastewater were included along with many other municipal services, such as street maintenance, central heating, care of parks and cemeteries, solid waste collection and other services. Some municipalities still operate that way. All these services were provided by a public company under the municipality called a communal services company. Among the ten vodovods visited, five (Konjic, Zenica, Banja Luka, Tuzla and Bijeljina) were true vodovods (although Bijeljina has no sewers at this time), one (Srbac) also provides additional services for solid wastes collection and public heating (although the latter system no longer is functional). Four (Cajnice, Gradacac, Orasje and Celic) provide multiple services. Celic is served by a privately owned company, the only such example among the ten. Even though some utilities are vodovods, and some are communal services companies, both are sometimes referred to in the report as vodovods, for convenience.
- b. Implications of These Differences on Strengthening Sector Capabilities Approximately half the locations visited provide water and wastewater sector services only, and the other half provide sector services along with many other services. The question of whether it is better to provide water and wastewater services under a separate organization is a policy decision that requires resolution in the near future, before significant sector strengthening efforts are implemented.

### 2. Ownership of Assets

All community public infrastructure physical assets are owned by the municipalities. Other than donor-funded projects, few municipalities have made any significant capital improvements to their systems since well before the war. Officials of Banja Luka vodovod stated that no new government-funded works had been constructed for more than 20 years.

### 3. Autonomy and Relationships Between Municipalities and Utilities

- a. Overview None of the ten vodovods currently have the degree of autonomy that will be required to permit them to develop to an acceptable level of capability. Every system operates under the fairly strict control of the municipality that it serves, and this control is frequently exercised in ways that are contrary to the viability of the vodovods.
- b. Municipal Organization All municipalities are governed by a municipal parliament, whose members are elected by the voters of the municipality. Parliaments are large. Most had 50 to 60 members, and only two had as low as 30 members. Conditions appear to vary relative to how the parliaments implement their executive functions, but in the majority of cases this function appears to be carried out by a mayor, selected by the parliament. Frequently there is also a deputy mayor, and in several instances the mayor is in charge of an executive body that has additional members. In almost all cases, however, the mayor appears to have a very strong voice in how all municipal public services are performed. In Tuzla, for example, the mayor holds weekly meetings with the head of the vodovod (and all other public service heads), while their management boards meet only monthly. The Tuzla mayor is said to require reports on significant problems and to give instructions on proposed actions to all service department heads. In addition, almost every municipality has a secretary of economy or secretary of utilities, who is responsible for the local

economy, industry and all public services. In some cases the secretary sits on the management board, and, in general, this office appears to have considerable influence over the operation of all public services. Obviously, the interests of industry (large water users and wastewater generators) are frequently in conflict with those of the vodovods.

- c. Typical Relationships Between Municipalities and Vodovods The most common form of municipal/vodovod relationship is that the vodovod reports to a management board appointed by the municipal parliament. However, some vodovods have additional levels of municipal control. As described above, the mayors and secretaries of economy or utilities also have considerable influence, even if they are not directly in the organizational chain of command.
- h. Membership of Municipal Management Boards Most management boards have five members. Members are always selected by the municipal parliament, usually for four year terms. Vodovod membership in the boards always constitutes less than a majority, but the matter is academic, as all significant decisions of the board are subject to review and approval by the parliament. In addition, the parliament (or the mayor acting for the parliament) is solely responsible for appointing the directors of the vodovods or communal services companies. **Table V-1** at the end of this chapter indicates the approximate composition of management boards in the communities studied. **Appendix A** is a translation of the Tuzla vodovod statutes establishing the regulations of the management board of the Tuzla vodovod, which is believed to be typical of the rules applicable to other vodovod management boards.
- e. Selected Problems of Lack of Autonomy There are several potential (and many existing) problems with this excessive municipal control that can adversely impact on the ability of the utility to operate effectively. The following is a sampling of some of the problems observed:
  - *Qualifications of vodovod directors may be secondary to political considerations.* A discouragingly high number of the ten vodovod directors interviewed had no training or experience in the sector prior to their appointment. Fortunately, there were a few decided exceptions to the general situation, and there were some with no experience who seemed to be performing reasonably well.
  - *The financial viability of the vodovods is secondary to political interests.* Tariff increase requests are often denied, and in a few cases they were decreased rather than increased, because municipal officials depend on the votes of users. Vodovod requests to shut off water to non-paying businesses and industries are usually denied, on the basis of economic concerns for the businesses and the municipality, at the expense of the economic concerns of the vodovod. The Entity governments are equally at fault, for imposing and vigorously collecting heavy taxes on vodovod *billed* revenues (rather than *collected* revenues), while they often account for a significant proportion of the vodovods accounts receivable. The military, hospitals and other public users almost never pay their sector bills.
  - *Municipal officials sometimes interfere in the vodovods' operations.* Several cases were mentioned by vodovod officials in which municipal officials sometimes direct them to undertake certain actions which are the prerogative of the vodovod.



- *Municipalities restrict vodovods in their ability to control personnel.*  
Vodovods are limited to the salary and benefits of all municipal employees. While several directors said they had the power of hiring and firing employees, or providing them benefits, this did not appear to be true in all cases. If they have such powers, they are fortunate, as the municipal controls are generally so strict that they can do so only with the forbearance of the municipality. It seems unlikely that most mayors would allow the vodovod company to act differently than other departments of the municipality.

#### **4. Organization of the Vodovods**

- Overview The manner in which the vodovods and communal services departments organize themselves varies widely. Differences are found not only between the two types, or by size of the community, but even within these categories. This is partly the case relative to the major divisions that report to the director, but much more so for the departments of those major divisions. The variations for the major divisions are described below, but the differences in the departments under each major division are too complex to summarize. Some appear reasonable, but many seem illogical.
- Types of Organizational Formats for Communal Services Organizations For the communal services organizations, one model (Cajnice) is organized with major divisions for each of the services, and a “common services” division that provides financial, personnel and other services to all the “operating” divisions. The water and wastewater division is in charge of only the operation and maintenance of the facilities. Another model (Srbac) has a technical division (under which lie all operating services), a financial/commercial division and a common services division. A variation (Celic) has the same format, but with a transport division instead of a common services division. The other two communal services organizations (Gradacac and Orasje) have a separate technical water and wastewater division, a financial commercial division, and another technical division for all other services.
- Types of Organizational Formats for Vodovods All five vodovods have two principal divisions: technical, and financial/commercial. Those two divisions are all that are found in three vodovods (Konjic, Zenica and Banja Luka). In the other two vodovods, there is a third division for legal/human resources (Tuzla and Bijeljina), while the latter also has a fourth division for engineering planning.

#### **5. Management and Administration**

- Management Capabilities in management appear to be variable. The duration of the visits was not sufficient to obtain the details needed to evaluate such a complex attribute. Some directors and senior staff described their procedures for allocation of tasks and reporting requirements in a manner that indicates they understand the concepts of good management. Others, particularly some of the clearly political appointees, seemed less capable. Several, however, seemed to be deficient in identifying priority problems, talked about clearly unrealistic plans for huge new capital investment programs, or did not appear to be dealing with the realities of the admittedly desperate conditions under which they are forced to operate. All vodovods suffer from the lack of programs designed to assist those in key responsible positions in becoming effective managers, and by being forced to operate and manage their work in a restrictive environment, lacking autonomy and control over basic decision making. In several vodovods, the director had no access in his office to basic information about his systems, and had to request this be obtained from his technical or financial deputies.

- b. Administration The limitations described above also pertain to the assessment of administrative capabilities. Vodovod administrative capacity suffers from a lack of logical organization of their functions, unclear identification of duties and responsibilities of both departments and employees, poor systems for reporting, and a serious lack of adequate office equipment and supplies. One office uses its fax machine to make copies; others have neither fax nor copier machines.

## **6. Planning, Studies and Mapping**

- a. Master Plans and Feasibility Studies When asked about master plans, vodovods either had none, referred to plans conducted by other agencies, or described what they considered a master plan for future guidance. To the extent that information was available about such plans, they appeared to be capital investment plans indicating the estimated cost of desired facilities, but without any estimates of operating costs. Moreover, such plans appeared to be essentially a compilation of improvements that they would like to make, without regard to their technical or economic feasibility relative to the utility's (and their customers) needs and ability to pay for them. There was some evidence of the existence of capital "budgets", but given the poor financial condition of most of the vodovods, it seems questionable that they are realistic. Bijeljina, a municipality without sewers has a plan for constructing a comprehensive new wastewater collection and treatment system, but no cost data were provided. Information for a proposed new wastewater treatment plant for east and west Mostar indicates that the cost of secondary treatment alone was about KM 25 million and the annual operating costs would be about KM 1.8 million. Bijeljina serves about half the population of (the combined) Mostar vodovod, so their costs might be expected to be in the order of half those amounts. The World Bank has concluded that such a system is not affordable to Mostar, in terms of annual operating costs alone, even if donors were to provide grant funds to construct the works. It seems likely that the same is true for Bijeljina.
- b. Mapping Mapping capabilities varied considerably. Few had good quality maps of their overall facilities, and most of those had been prepared some time ago by others. These were often one-of-a-kind maps that could not be reproduced, and were out of date. Many directors complained that they had no idea where their water pipes and valves were (covered over by decades of paving programs), and were unable to isolate much of their system in case of main breaks. A few talked knowledgeably about GIS (Geographical Information Systems) mapping but only one utility has such a capability (Zenica). In one vodovod, the director and his technical officers could not locate their two major reservoirs and pump station complexes within a radius of over ten kilometers on a zoning map.

## **7. Operational Procedures**

- a. Facilities Requiring Operation Many of the facilities in the water and wastewater systems studied were constructed under procedures of the then Government of Yugoslavia, and most of them date back more than 25 years. The facilities are generally relatively simple, in that most water systems consist of springs and wells, and only three of the ten provide water treatment. In addition, none of the ten have wastewater treatment plants that are functioning.
- b. Operation Manuals In most cases, only those facilities recently constructed by donors had operation and maintenance manuals. One vodovod (Bijeljina) said they had manuals for some of the older equipment installed well before the war. In the absence of manuals, most vodovods were operating their facilities in accordance with procedures that appeared to have been developed by people no longer associated with the vodovods. That is not

necessarily an unacceptable means of operation, but some operators seemed not to understand why they were following those procedures.

- c. Operational Effectiveness In general, management supervisors and operators seemed to be performing their services reasonably effectively, given the handicaps they faced with aging systems and an inadequate supply of spare parts.

## **8. Preventive Maintenance and Repairs**

- a. Concepts and Practice of Preventive Maintenance Most technical directors and operators understood the need for preventive maintenance and several described programs in their systems to ensure that it was performed. The visits and inspections were too brief to determine if these programs were being implemented. The fragile financial situation of most vodovods raises questions about whether preventive maintenance is being practiced at the levels required to prolong the life of existing facilities. On average, vodovods spent only 3.5% of their total costs on maintenance and repairs in 1998. In several vodovods, it was clear that there is little or no preventive maintenance.
- b. Repairs Meter repairs are discussed elsewhere. Repair of leaks in water mains and removal of blockages in sewers was a serious problem for most vodovods. Only a few have truck-mounted high-pressure pumps to flush or break up blockages in sewers. Gradacac vodovod mentioned they had to rent the unit belonging to Zenica vodovod when they have serious blockages, at a portal-to-portal cost of KM 140 per hour. Repairing 10 to 20 leaks or breaks in water mains per month was reported by Gradacac vodovod, which is probably typical of medium sized utilities.

## **9. Personnel Issues**

- a. Staffing Levels Many vodovod officials reported that their current staffs are from 30% to 50% lower than pre-war levels, and therefore consider themselves understaffed. However, analysis indicates that almost all vodovods are more heavily staffed than those of efficient western utilities (which often have four employees or less per thousand connections), or even “intermediate” utilities in terms of efficiency, such as those in Latin America (say ten per thousand). As shown in **Table V-2** at the end of this chapter, most of the vodovods have staffing levels of from 10 to 16 per thousand connections. The two that are below ten include Bijeljina, which has no wastewater system, and Celic, which not only has no sewers but it is privately owned and appears to be operating on a survival basis. There are so many factors that affect this indicator, however, that it must be considered only a very rough measure of a utility’s staffing efficiency. So while the vodovods may be somewhat overly staffed, this does not appear to be a major concern.
- b. Working Hours Official working hours are said to be 42 hours per week, spread over six seven hour work days, from about 8 AM to 3 PM. However, observers outside the vodovods indicate that actual hours worked is considerably less, perhaps closer to five to six hours a day, and usually just for five days. Second jobs are not uncommon.
- c. Training No vodovod currently provides any significant training for their staff, other than that provided in conjunction with donor-funded programs. Some vodovods said that at one time they had sent operators to technical institutes for training.
- d. Personnel Management Personnel affairs are frequently assigned to a department called “legal and other services”. Human resource development (HRD), under the direction of a trained professional, in terms of evaluations, incentives, training, goal-setting or other HRD functions, does not appear to be a high priority activity among the vodovods.

## **10. Availability of Information and Reporting**

- a. Availability of Information Limitations of time and incomplete responses prevent a clear understanding of the extent to which data gathering, availability of information and reporting is practiced. The information obtained indicates room for considerable improvement. In many of the interviews, directors could not provide answers to requests for data that directors in western utilities would have at hand, probably on their desk top computer. Often data related to population served, number and types of customers and connections, volumes of water produced and other absolutely essential data had to be sent for from other departments. This seems a clear indication of significant problems with data collection and reporting procedures.
- b. Reporting Officials of one vodovod said that its management board required only semi-annual reports, but they send reports of activities monthly. In discussing the matter of record keeping and reporting of the schedules for operation of wells, another utility said they keep no written records, nor do they report their operating schedules to the director. One vodovod has printed forms that key staff members are required to complete daily (manual notations), and submit to the director. However, the forms appear to be principally a means of advising the director of any problems that require action. Otherwise, notations such as “everything OK” seem to be a standard remark. Another vodovod said that reports on water quality were routinely submitted to the director, but examination of a typical report indicated that it contained the unhelpful comment that “water quality (for that particular sample) meets the standards”. One large vodovod admitted that its systems for reporting were not adequate, and said they would like to have training in the development of an appropriate MIS.

## **11. Customer Relations**

- a. Reactive Relationships with Customers Almost universally, the vodovods’ programs for dealing with customers are aimed at reacting to complaints. At best, vodovods list phone numbers of department heads on the bills so customers can call directly, or they establish offices at their administrative buildings and/or the municipal headquarters where people can lodge complaints. The latter serve the primary purpose of places where people can come to pay their bills. In other cases, they said that people can make their complaints to meter readers (when they have functioning meters), or to those who hand-deliver the bills, a fairly common practice. One vodovod complained that customers want to talk only to the director, and another said that people complained to the mayor, not the vodovod, and the mayor then calls them to take action. Again, this seemed to indicate a focus on how complaints are dealt with, not how relationships with their customers could be improved.
- b. Positive Programs for Improving Customer Relations Very few utilities take any positive actions to improve customer relations. Banja Luka recently began a program of preparing and inserting small informational pamphlets in their customers’ bills, every other billing period. Three recent issues covered such subjects as: (1) “The System of Potable Drinking Water is Your System”, (2) Reasons for Interruptions in Water Supply and How You Can Reduce Leakage and Waste”, and (3) “How You can Save Potable Water”. They also have plans to set up a dedicated phone line for customers to contact the utility. There are occasional positive activities, such as a program in Zenica to offer to write off large outstanding bills if customers will agree to start and continue payments for future services. They also have a program that offers to send specialists to their houses or apartments to repair leaks inside their dwellings. None seemed to have any knowledge of the value of a dedicated, professional capacity for developing good relations with their customers, despite their obvious problems in collecting payments owed them.

**Table V-1**  
**Vodovod Management Board Memberships**

Municipality	Members of Vodovod Management Board				Remarks on Other Controls
	Total	Vodovod	Municipality	Other	
Konjic	3	1	1	1	
Caijnice	5	0	3	2	
Zenica	5	2	2	1	
Banja Luka	5	2	2	1	Also a supervisory board (Note 1)
Srbac	5	2	3	0	Also an advisory board (Note 2)
Tuzla	5	1	1	3	See comments on role of mayor
Gradacac	5	1	0	4	
Orasje	5	1	0	4	
Bijeljina	5	2	0	3	
Celc	Private company under “contract” to the municipal parliament (Note 3)				

Note 1 Banja Luka has a supervisory board that is responsible for ensuring that the vodovod (and other services) follows all rules and regulations of Republika Srpska.

Note 2 Srbac has an advisory board (for all public services) that collects data, studies problems, makes recommendations, and gives “political direction” (which could not be easily defined)

Note 3 In Celc there are two private community service companies that divide responsibilities for water supply and wastewater (and all other normally public services) in the municipality. Each serves half of the 12 communities in the municipality. The private company (“Trgotransped”) that serves the “town” of Celc (pop. 6,500) and five “villages” (total pop. 2,700) does so under a decision of the municipal parliament. That decision indicates that the “rights and liabilities associated with the operation and maintenance of the assets” (butnot their ownership) which the municipality is transferring to the company are to be set forth in a contract between the two parties. However, that decision was issued on 9 March 1998, but no contract has ever been drafted, let alone signed. (It was the responsibility of the municipality to prepare the draft.) Celc is a new municipality created by the Federation of BiH. It was formerly part of the municipality of Lopares, which is now in Republika Srpska. In the absence of a contract, the owner and the mayor appear to work things out on a personal basis. See Appendix B for more details about conditions in Celc.

**Table V-2****Customers and Employees Compared to Water Connections<sup>15</sup>**

Municipality	Vodovod or Communal Services Co	Population Served by Water	Number of Utility Employees <sup>16</sup>	Number of Water Connections	Employees per 1,000 Water Connections	Number of Persons per Water Connection <sup>17</sup>
Konjic	Vod	14,000	25	2,500	10	5-6
Cajnice	Com	4,500	10	860	12	5
Zenica	Vod	91,000	163	8,100	20	10 <sup>18</sup>
Banja Luka	Vod	240,000	255	19,500	13	12
Srbac	Mixed <sup>19</sup>	11,000	40	3,500	11	3
Tuzla	Vod	130,000	211	17,000	12	8
Gradacac	Com	15,000	56	3,950	14	4
Orasje	Com	5,500	20	1,400	14	4
Bijeljina	Com	75,000	108	15,000	7 <sup>20</sup>	5
Celice	Com	6,000	6	1,550	4 <sup>21</sup>	4

<sup>15</sup> The basic data are very approximate, so the numbers of employees per 1,000 connections and the number of persons per connection should be taken only as rough indicators of these measures.

<sup>16</sup> The number of employees has been adjusted for the communal service companies to reduce the staff associated with non-sector activities.

<sup>17</sup> This is the estimated number of persons served for each connection to the water main.

<sup>18</sup> Zenica, Banja Luka and Tuzla are relatively large cities with many multi-family apartments, which results in higher numbers of persons per connection.

<sup>19</sup> Srbac has responsibility for solid wastes as well as water and wastewater, but staff associated with that function are not included in the number of Utility Employees listed in the table.

<sup>20</sup> Bijeljina has no sewers and therefore no staff to maintain them, which may account for the lower number of employees per thousand connections.

<sup>21</sup> Celice is a seriously under-funded private company and appears to be operating on a survival basis, so the low ratio of employees to connections has little meaning.

## CHAPTER VI FINANCIAL ASSESSMENT

### 1. Introduction

- a. Specific Problems Related to Financial Assessment Assessment of financial data was complicated. Difficulties in the collection and interpretation of the financial activities and reporting used by vodovods were compounded by such factors as:

- The use of different currencies (KM, or convertible marks in the state of Bosnia and Herzegovina, which are equal to German Deutsche Marks; HRK, or Croat kunas; and YUD, or Yugoslavian dinars),
- Two different accounting systems in the RS and FBiH, and
- Unclear terminology used in the standard accounting systems used

However, in most cases the general accounting techniques and internal controls appeared to be reasonably consistent. Probably a more comprehensive review would reveal some deficiencies in the financial system that should be remedied.

- b. Detailed Financial Statements Detailed financial statements obtained from the ten vodovods were prepared and are available from USAID or CDM. They were considered to be difficult to interpret because of lack of consistency and confusing terminology, and so were not included in this report.

### 2. Financial Policies and Audits

- a. General Most vodovods appear to have established set policies regarding day-to-day financial transactions. The vodovod staff are very familiar with this system. The policies and practices are opaque, however, and may be subject to abuse.
- b. Annual Audit of Financial Reports As far as could be determined, the vodovods do not conduct comprehensive external or independent audits of their books and financial reports. These matters were not discussed with the vodovods' municipalities, so it is possible that the municipalities may have retained an independent auditor to review all the municipalities' financial records, including those of their vodovods. Another governmental audit agency is referred to as the "Financial Police", but their reviews appear to be limited to the revenue collected and the taxes paid (typical audit subjects for a revenue agency of the government). It is doubtful that those audit results are available to the public, or would serve the purpose of a comprehensive, independent, external audit if available.
- c. Certification of Auditors There are independent accountants in the country that are certified by institutions in the governments of both Entities. These institutions seem to be called "banks"<sup>22</sup>. Most often these certified accountants are employees of the vodovod or municipality. Certification is provided as proof that the accountant is qualified to prepare income statements and balance sheets in a manner acceptable to their respective "banks" or revenue agencies.

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<sup>22</sup> These institutions are not truly banks, but organizations that represent the revenue agencies of the Federation and the RS. They appear to have control over all fiscal transactions and collection of taxes for public entities. In the Federation, this organization is called "ZPP", which translates as the "Institution for Transactions and Control of Payments". In the RS, this organization is called "SDK", which means "Institution for Social Bookkeeping".

### **3. Accounting Practices**

- a. Types of Accounting Systems Used All vodovods studied used one of two accounting systems. The accounting systems and procedures are mandated by either the Federation or RS laws. In the Federation, the accounting law is entitled the "Kodeks", and it is used by all FBiH public entities. There appears to be one uniform chart of accounts and set of standards for all entities (public utilities, government agencies or other entities). The RS has its own set of accounting laws and standards, which also appear to be uniform for all public entities.
- b. Accounting Procedures and Practices Within the Vodovods The vodovods all follow their appropriate accounting laws. They are required to prepare and submit semi-annual reports to the "bank" in a standard form that is based on these laws. An "independent accountant", who is certified to prepare these reports, must also sign the report. Finally, a periodic review of the records is conducted by the Financial Police to verify that all revenues are correctly reported. The accounting laws seem generally adequate in meeting the "bank's" needs. The standards incorporate fiscal controls and assurance of proper disclosure of transactions. However, these laws and standards do not facilitate the vodovods' ability to record and report its financial activities to the extent that would be required as autonomous water and wastewater utilities.

### **4. Role of Barter in Vodovod Financing**

- a. Use of Barter as Payment for Services The practice of trading goods and services for amounts owed by customers, commonly called the "barter system", was common to all vodovods. These transactions can be as simple as trading water bills owed by petrol stations for gasoline for vodovod vehicles, or to a metal manufacturer for receiving pre-fabricated shop buildings used as vodovod workshops. A complex three-party transaction involving a vodovod, elektroprivreda and the Army took place in Banja Luka. In this transaction the Army owed the vodovod for water service, the vodovod owed the elektroprivreda for electric service, and the elektroprivreda owed the government for taxes. All traded their services and tax owed, which directly benefited the vodovod, in exchange for a reduction in their respective accounts payable for water service. This worked well for the vodovod, as the Army is always delinquent on payments.
- b. Value of and Concern About the Barter System The barter system serves a purpose in an economy where cash is limited. Without credit or cash many of the vodovod customers are not in a position to pay, so receiving something tangible is better than receiving nothing at all. This is an acceptable practice, as long as there are policies and guidelines to protect against abuses by ensuring that a valuation is placed on goods or services received in barter, and that they are described and entered into the financial records. There appeared to be no consistency in which these transactions were valued and recorded, leading to potential abuse by accepting goods and services for personal purposes.

### **5. Financial Systems and Records**

- a. Separation of Services Unless the vodovod operated solely as a water and/or wastewater entity, the activities and costs were not separated from all other public services. Five of the ten pilot vodovods were part of a municipal entity that provided other services such as solid waste collection. Generally, the water and wastewater revenues and costs were not reported separately when they were combined with other services. Thus, donors and lending agencies that need to review the vodovod financials cannot determine the ability of the vodovod to maintain the investments donated or repay monies borrowed.



- b. Uniform Chart of Accounts The vodovods' water and wastewater activities do not have a separate uniform chart of accounts. The chart of accounts currently used by the vodovods is an adaptation of the accounts used by all public entities in either the FBiH or RS. There is no uniform chart of accounts that separate water and wastewater functions from all other public service functions.
- c. Y2K Problems Most vodovods had computer systems in operation. Many of these had systems that were antiquated and in danger of losing data when the year 2000 starts (Y2K). There are several vodovods that almost certainly will have problems with their general and customer accounting computer systems when the year 2000 begins. These include Srbac, Banja Luka and Tuzla. Most of these vodovods have old hardware that requires replacement. The loss of customer records and interruption of billing and accounting could put additional strain on an already tenuous enterprise.
- d. Management Information Systems Most vodovods lacked computerized accounting systems. Only one or two of the vodovods visited had what might be considered adequate management information systems (MIS). The vodovods with adequate (at best) computer systems include Konjic, Celic, Bijeljina, and Zenica. Zenica's system is part of an outsource contract and is state of the art. However, even in this group most of the finance departments did not have basic software that could be used for financial analysis such as spreadsheet applications, word processing or data base applications. All vodovod financial staff expressed interest in obtaining these software applications and/or additional hardware to improve their performance. One Finance Director (Cajnice) was taking lessons in computer applications on her own, hoping that there was a chance that the vodovod (public utility) would obtain one. Cajnice's accounting system is completely manual. Larger vodovods had different requirements and appeared to need expert guidance in selecting hardware and financial software applications. Tuzla staff has developed a plan for MIS improvements. This plan has been shelved until funding is available.
- e. Budgeting Half the vodovods in the pilot program had prepared budgets for fiscal year 1999. The following vodovods, the largest of those studied, have water and wastewater service as their primary function: Tuzla, Banja Luka, Srbac, Bijeljina and Zenica. Of these five, Tuzla stated that they prepare and report their budget on a departmental basis. Banja Luka stated that they also had plans to prepare and report their budget in this manner on a trial basis. The remaining vodovods report their budgets in a manner similar to that required in the government's Income Statement form. In addition, only Banja Luka prepared a periodic reconciliation more frequently than twice a year.

## 6. **Tariff Setting**

- a. General The vodovods in the pilot program used several different rate structures which were quite diverse. One vodovod charged a lump sum fee per person per month for all residential customers and a uniform metered rate for commercial and industrial customers. Another vodovod had different charges per cubic meter sold for each classification of customer plus a monthly customer charge that increased based on the size of the meter serving the customer. Most of the vodovods had one thing in common: revenues from their existing tariff rates would not cover annual expenses even if all bills were paid.
- b. Rate Structures Most vodovods have rate structures that need to be changed and rates that need to be increased, in order to cover costs. Several vodovods had alternative rate structures, whereby, if a meter replacement program was in effect, the rate structure had two components:
  - (1) A fixed customer or meter charge, and
  - (2) A volume related charge.

The customer charges varied, based on the size of the meter or type of service. Srbac and Bijeljina had established tariffs with this type of rate structure. Other vodovods charged a volume rate that was uniform for all water sold (a common practice for most vodovods). None of the vodovods used

a declining rate structure (reduced costs per cubic meter for larger amounts of water used by a given class of customer). On the other hand, none used an inclining rate structure, either (increased costs per cubic meter for larger amounts of water used by a given class of customer). Several vodovods used a form of inclining rate structure in which larger users, such as industrial customers, are charged a higher (but still uniform within their class) rate per cubic meter than the smaller users such as residential customers. The use of a customer or meter charge by Srbac and Bijeljina ensures that the vodovod will recover at least some of its fixed costs. Differences in the volume rates charged can be used to send the vodovod customers appropriate price signals (encourage greater water use, conserve water, or provide a subsidized rate for low or fixed income customers).

Almost all vodovods in the pilot program metered most of the consumption of large commercial/industrial<sup>23</sup> customers. For residential customers, if the vodovod did not have working meters for residential homes or apartment buildings, the amounts charged were based on estimates. The bills were based on either an estimate of use based on historical usage (before the war), a lump sum per person estimated at the connection, or an amount based on an estimated per capita consumption (often very low) for an estimated number of persons at that connection. **Table VI-1**, attached at the end of the chapter, presents the unit prices charged by each vodovod in the pilot program for water and wastewater. This table also estimates typical bills for water and wastewater services for residential customers for a family of four, and an estimated usage of 200 liters per person per day.

- c. Ancillary Service Charges Most of the vodovods in the pilot study were charging a connection fee. No other fees for special services were noted. Special services are those services that incur additional costs to provide but that benefit or punish only the few customers for whom such services apply. Examples include fire protection, turn-on/turn-off fees and late payment charges.
- d. Affordability There is little data on income and expenditures, and therefore affordability is difficult to assess. In Banja Luka, the municipality made a study that indicated that all utility costs (water, wastewater, telephone, heating and electricity) amounted to nearly 50% of total household costs. The study also showed that water represented only 7% of total utility costs. On that basis, water represents only 3.5% of total household costs.
- e. Special Rates for Low or Fixed Income Families It appears that none of the vodovods have established a lifeline or subsidized rate for low or fixed income customers. The Tuzla vodovod gave one example of a family in need of this kind of assistance. The head of the household was a grandmother with eleven grandchildren living with her. All parents were killed in the war. She was on a monthly fixed income that was less than her monthly vodovod charges. The vodovod no longer charges her for services, but such relief should be the responsibility of the government.

## 7. **Meter Reading, Billing and Collecting**

- a. Meter Reading and Billing Currently all vodovods read meters and prepare bills on a monthly basis only for *commercial and industrial* customers. Most vodovods read meters and bill their *residential* customers on a quarterly, semi-annual or annual basis. Each vodovod has an established schedule for commercial/industrial customers and for residential customers. The frequency used by a vodovod appears related to the number of residential customers and the number of meter readers available to accomplish the job. Additional information on meter reading and billings is described in paragraph (c), below. As described in paragraph (c), some meter readers are required to prepare and deliver bills as well as read the meters. This is very time consuming, and probably accounts for the infrequent reading and billing of residential customers' meters.

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<sup>23</sup> Generally, the vodovods include "public" customers in the designation listed as the industrial class of customer. Public customers include frequently large users such as the military, schools, hospitals and public buildings.

- b. Overview of Collection Problems The most serious financial problem expressed by the vodovod Managing Directors and Finance Directors was their inability to collect customer bills. Their attitudes toward this issue ranged from total frustration to resigned acceptance. **Table VI-2**, at the end of the chapter, presents the estimated 1998 collection rates for each of the ten vodovods in the pilot program. Collection rates range from 10% to 82%, with an average of about 40%. The collection rate is determined by dividing the annual collections by annual revenue billed. These collection rates were calculated by the vodovods. In some cases, the vodovod calculated collection rates only for individual customer classes. In this situation, the total collection rate was estimated for purposes of this report. Banja Luka had the highest collection rate among all the pilot vodovods. The high rate results from their ability and willingness to use the court system to pursue debtors. They have retained an attorney that specializes in the collection process. This attorney has developed a system that expedites court cases so that it is now an effective part of the vodovods' collection procedure. Other vodovods indicate that they wait years for court decisions against customers that do not pay. In Banja Luka, the court procedure is only one or two months. This indicates the value of an alternative, aggressive collection procedure, and shows significant ingenuity and persistence by this vodovod.
- c. Collection Policies and Practices Several of the vodovods did not have a clear collection policy. Those that have policies did not publish them, so customers and vodovod staff were frequently unaware of them. Most vodovods did have a specific payment period that they adopted, but the date due was not noted on the customer's bill. In most vodovods, the customers' bills display only the current amount due. Previous amounts owed were not presented on current bills issued by most of the vodovods, so customers could not tell the total amount they owed. In Srbac, the meter reader hand-calculates the residential customer bills at the customer's residence. Three copies of the bill are made at that time. The meter reader knocks on the door and asks for payment. If payment is made, the customer receives a copy of the bill. If the customer does not pay, the meter reader keeps all three copies of the bill and brings them back to the vodovod Finance Director. The customers do not receive another notice of the amount due that billing period unless they go to the office and pay it on their own initiative. Banja Luka had a clear policy for collections. The commercial customers are given two late payment warnings. The residential customer is given three warnings. The residential customers in multi-family buildings and industrial customers are sent to court if payment is not received after final notices are sent out. The residents in single family homes and commercial customers are disconnected.
- c. Collections from Multi-Family Buildings All vodovods in the pilot study stated that they could not shut-off multi-family buildings for non-payment because the customers that do pay would be punished because of those who do not. They also believe that it is impracticable to install individual meters for each flat.
- d. Collections from Public Customers Collection rates from public customers are significantly lower than those from other customers. The largest category of accounts receivable for almost all ten vodovods was the military and/or hospitals. The vodovods appear unable to collect this money from the government, and they lack municipal and government support to collect the amounts owed, dating back since the start of the war. They noted that all NATO SFOR encampments pay their bills promptly. Several vodovods also maintain on their books large amounts owed since before the war, which probably are uncollectible.
- e. Lack of a Meter Change-out Program The vodovods in the pilot study all had meters. However, a significant numbers of meters did not function properly. For the most part, the meters that were not functioning were residential customer meters. Some meters were damaged in the war. At least two of the vodovods in the pilot program, Zenica and Banja Luka, have an aggressive meter change-out program. The vodovods inability to meter their customers has implications for both the financial and institutional capacity of the vodovods.

## 8. Vodovod Expenses

- a. Summary of and Comments About Vodovod Expenses The terminology used in the vodovods' accounting systems relative to expenses is not always sufficiently descriptive to identify different categories of expenses. An approximate comparison of expenditures in 1998 for major items for nine of the ten vodovods is presented in **Table VI-3**. While many vodovods complained about the excessive energy costs, electricity amounted to an average of only 11% of total costs for the vodovods, or about the same relative amount spent on materials. Energy costs were over 25% in Orasje and Celic.
- b. High Taxes Charged to Vodovods Since the beginning of 1999, vodovods have been charged taxes by their Entity governments, so these taxes are not included in the expense summary shown in table VI-3. For vodovods in the Federation, they are subject to three taxes, essentially a water pollution (or "protection") tax (KM 2 per person), a water source "extraction" tax (0.1 KM per m<sup>3</sup>), and, in the Federation, a general tax calculated at 10% of the amount they bill their customers. That tax is particularly onerous since it is levied against the amounts billed, and not revenue actually collected. In Republika Srpska, they charge only protection and extraction taxes, at a rate of KM 0.01 per m<sup>3</sup> each. Taxes collected by the FBiH are distributed to various government entities in the following manner:

FBiH, 10 percent; Local Canton, 20 percent; and Vodoprivreda, 70 percent

When one vodovod attempted to record and pay tax based on only what was collected, the Financial Police determined that the vodovod had not paid enough taxes. In cases such as this, the Entities have placed liens on their bank accounts until the taxes due are paid. There is no avenue for appeal, and therefore no opportunity for the vodovods to plead their case. It is difficult to estimate the impact these taxes will have on the 1999 costs, since some vodovods have taken measures to minimize the impact.

- b. Special Tax Line Item on Customer Bill Several vodovods (Srbac, Banja Luka) list this tax as a separate line item on the customers' bills. This enables the vodovod to track the true amount of tax due to the government. It also provides some protection for the vodovod if the tax were to change and the municipality does not permit an increase in basic rates to cover the additional expense.
- c. Intra-Departmental Cost Allocation Study Common services used and/or provided by the vodovod generally were not allocated in an equitable manner. Vodovods have no predefined allocation method to distribute common costs such as Directors' salaries, finance department salaries, and costs for electricity. In addition, it appeared that there was an absence of inter-departmental allocations of costs and materials used for the benefit of other non sector departments (street maintenance, for example). Only the vodovod in Srbac has an established method of allocating these costs.
- d. Inter-Departmental Transactions None of the vodovods recorded charges and/or payments to other municipal organizations. These charges are normally for water and other goods and services provided to and/or received from those departments (inter-departmental transactions). In one situation, a vodovod reported a positive cash flow for 1998, yet the financial reports showed a decline in fixed assets, a decrease in a capital reserve (funds set aside for plant improvements) and a decrease in the capital (equity) account. It appears as though the owner (municipality) withdrew capital from the vodovod, but this could not be confirmed.

- e. **Renewal and Replacement** All vodovods include depreciation as a funding mechanism in their rate revenue requirement. The funds from this component of rate revenue (assuming they are collected) can be used by the vodovod to repair and replace existing plant and equipment. However, six out of the ten vodovods reported a loss in 1998, and the others reported an essentially break-even situation. This indicates that vodovods with losses were unable to bill enough revenue to recover all depreciation costs. In addition, the collection rate for all vodovods was extremely low. It is unlikely that any of the ten had enough internally generated cash on hand to make repairs or replace plant and equipment in 1998.

## 9. **Vodovod Financial Condition**

- a. **General** Several financial ratios and generally accepted methods of analysis were used to determine the financial strength of the pilot vodovod. Not surprisingly, this analysis proved that for most of the vodovods, their existing financial condition is very weak. The strongest appear to be located in the RS, although this depended on the size of the vodovod and the diversity of the public services it is mandated to offer. The financial analysis is separated into four measures, each of which has relevance to the vodovods' financial condition. These measures are discussed in the following sections and summarized in the tables attached at the end of this chapter.
- b. **Cash Flow** Cash flow, the relative availability of cash-on-hand to pay for current expenses, is a measure of the vodovod's ability to internally generate funds. The tool used to measure cash flow is a Statement of Sources and Uses of Funds. It provides information on selected accounts that either provide cash or require cash. It also indicates where the funds come from (Sources) and how they are spent (Uses). In the present economic situation, Bosnian vodovods are not in a position to seek financing from capital markets. Nor are any of the vodovod owners (the municipalities) in a position to infuse capital for much needed repairs and improvements. Thus, the only source of financing is from donors or revenues from the customers. This statement analyzes the ability of the vodovods to generate revenues from its customers adequate to their needs. **Table VI-4** at the end of the chapter presents a summary Statement of Sources and Uses of Funds for each of the vodovods based on reports they submitted to FBiH's or RS's "banks".

**Conclusions on Cash Flow (Table VI-4)** This Statement is very difficult to interpret because (1) it is based on billings, which on average are only about 40% of actual revenues received, (2) there is a significant level of funding from donors which does not fit the normal pattern, and (3) it is not suitable for the unusual conditions that exist in Bosnia and Herzegovina. Still, taking these factors into account, the table shows that none of the vodovods is generating enough cash to meet its needs.

- c. **Donor Capital** Three of the eight pilot vodovods reported in Table VI-4 had a negative cash flow (total sources net to less than zero). Banja Luka had the highest reported negative cash flow. This is an indication of donor capital provided to those three vodovods during 1998. Banja Luka has been and continues to receive nearly KM 16 million of in-kind donations from USAID and EU. This is for source of supply and infrastructure improvements. In addition, it has received over KM 600,000 from the Swiss and Japanese governments. Orasje vodovod received approximately KM 50,000 from the German government. This was an in-kind donation for a pump station. In addition, the municipality received KM 1.6 million in in-kind donations from USAID over the last few years. This amount was not reflected on the vodovods books because the donation was given to the municipality, not the vodovod. The municipality had not provided the vodovod with the financial information concerning the transaction. This donation was to construct a new source of supply and transmission line. Konjic has been receiving in-kind donations from Italy and Austria. This donation provides materials to build a new pipeline looping the main part of the city and providing neighboring villages with access to water supply. The accounting systems used by all the vodovods do not have a specific account in which to record donations. Therefore, the contribution is added to capital.

This does not explain why the Banja Luka vodovod can have such a large negative cash flow in a year. There is a mismatch between the increase in capital and the increase in fixed assets. For example, like Banja Luka, Tuzla reported a significant loss for 1998. This vodovod used internally generated funds and increased payables to maintain operations. Clearly, it had donor funds to pay for plant improvements that can be traced by an increase in fixed assets that matches the increase in capital.

- d. Interpretation of Reporting and Disclosures There are several nuances to the accounting reports. In Banja Luka, for example, the loss displayed on Table VI-4 (KM 2.8 million) comes from the balance sheet for 1998. However, the Profit and Loss Balance Statement (Income Statement) reports a loss of only KM 1.2 million. The difference is explained as "revalorization". This has something to do with inflation in the RS. Apparently, the system does not have a formal procedure that can be used to adequately disclose this adjustment. This is one of the many uncertainties in accounting and financial reporting encountered in the evaluation of the financial condition of the vodovods. In part, the uncertainties may be lie in the difference between the definition of financial terms used locally and in the west. However, it is probable that most of the issues have to do with the inadequacy of the accounting systems that the vodovods are required to work with.
- e. Accounts Receivable Turnover and Collection Periods All vodovods except Banja Luka had moderate to poor collection ratios. **Table VI-5**, at the end of the chapter, presents the ratios used to measure the pilot vodovod accounts receivable turn over and collection periods. The more commonly used measure is the number of days that have elapsed from sending out the bills until they are collected. A reasonable average collection period should be from 30 to 90 days.

Conclusions on Accounts Receivable Turnover and Collection Period (Table VI-5) Only Banja Luka, at 54 days, has an acceptable collection period for its accounts receivable. Zenica, Tuzla and Konjic have particularly poor performance in collecting their bills, ranging from about 300 to 450 days. The second best record to Banja Luka is more than twice as long at over four months.

- f. Liquidity Ratios Liquidity is an indicator of how easily a company's assets could be converted into cash. This is also an important indicator of the current amounts owed by the vodovod and the ability it has to cover those debts over a short term. **Table VI-6** presents two liquidity measures, the Current Ratio and the Acid Test. Because the vodovods have a very high level of receivables, the Current Ratio was developed both with and without the accounts receivable balance. Acid Test ratios for all pilot vodovods except Banja Luka were determined without the accounts receivable balance.

Conclusions on Liquidity (Table VI-6) Most vodovods had fairly good Current Ratios, with receivables included, but that is not a realistic measure. Because there is little chance of collecting a large portion of those receivables, it is more realistic to examine the measures without the accounts receivable included. Two vodovods had a Current Ratio that was less than 1.0 when receivables were eliminated. Only three vodovods were able to sustain the Acid Test. Zenica had the strongest liquidity ratios of all the vodovods studied.

- g. Profitability Ratios The profitability ratios measure the vodovod's financial success as it relates to revenues and expenses. **Table VI-7**, at the end of the chapter, presents the ratios used to determine the pilot vodovods' ability to generate enough revenue to cover their expenses. The two ratios used to measure profitability are the Operating Margin and the Assets to Net Worth Ratio, which are described in Table VI-7. Profitability is important because profits are currently the only source, outside of international donations, of meeting the vodovods' needs

Conclusion on Profitability Ratios (Table VI-7) The results of the data from this table indicate that none of the vodovods are profitable, and most are seriously in the red. The situation is compounded because the data are based on *billed* revenues, so the losses are even worse than indicated. On the other hand, the Assets to Net Worth Ratios are all close to the optimum level of 1.0, an indicator of zero debt. This is understandable since the vodovods have never been in a position to borrow money for their capital investment programs.

- h. Summary Conclusion on Financial Condition of the Vodovods By almost any measure, almost all the vodovods are in extremely poor financial condition.

**TABLE VI-1**

**Vodovod Water and Wastewater Tariffs - Typical Monthly Residential Bills**

Vodovod	Monthly Meter Charge	Water		Wastewater		Est. Monthly Family Bill <sup>24</sup>
		Resident	Industrial	Resident	Industrial	
Konjic	-	0.75KM p/p <sup>25</sup>	? <sup>26</sup>	0.75KM p/p	?	KM 6
Cajnice	-	0.75KM p/p	0.125KM/M <sup>3</sup>	0.75KM p/p	0.125KM/M <sup>3</sup>	KM 6
Zenica	-	0.3KM/ M <sup>3</sup>	0.8KM/ M <sup>3</sup>	0.15KM/ M <sup>3</sup>	0.5KM/ M <sup>3</sup>	KM 11
Banja Luka <sup>27</sup>	-	0.22KM/ M <sup>3</sup>	1.23KM/ M <sup>3</sup>	0.07KM/ M <sup>3</sup>	0.46KM/ M <sup>3</sup>	KM 7
Srbac <sup>28,29</sup>	0.84KM	0.26KM/ M <sup>3</sup>	1.07KM/ M <sup>3</sup>	0.13KM/ M <sup>3</sup>	0.51KM/ M <sup>3</sup>	KM 10
Tuzla <sup>30</sup>	20 KM	0.8KM/ M <sup>3</sup>	1.0KM/ M <sup>3</sup>	0.25KM/ M <sup>3</sup>	0.35KM/ M <sup>3</sup>	KM 28
Gradacac	-	0.63KM/ M <sup>3</sup>	1.0KM/ M <sup>3</sup>	0.62KM/ M <sup>3</sup>	1.0KM/ M <sup>3</sup>	KM 30
Orasje	-	10KM/Mnth 0.33KM/ M <sup>3</sup>	0.65KM/ M <sup>3</sup>	10KM/ M <sup>3</sup> 0.32KM/ M <sup>3</sup>	0.65KM/ M <sup>3</sup>	KM 20
Bijeljina <sup>31</sup>	1.40 KM	0.27KM/ M <sup>3</sup>	1.59KM/ M <sup>3</sup>	-	-	KM 8
Celcic	-	0.48KM/ M <sup>3</sup>	0.48KM/ M <sup>3</sup>	0.47KM/ M <sup>3</sup>	0.47KM/ M <sup>3</sup>	KM 23
<b>Average</b>	-	-	-	-	-	<b>KM 14</b>
<b>Median</b>	-	-	-	-	-	<b>KM 11</b>

<sup>24</sup> Annual water and wastewater bills are based on the current tariff charges per cubic meter for residential customers and assume a consumption of 200 lpcd and a family of four persons.

<sup>25</sup> p/p means per person

<sup>26</sup> Municipality determines the rate for industrial customers and schools on an individual basis.

<sup>27</sup> Water rate includes 0.04KM/ M<sup>3</sup> for tax.

<sup>28</sup> Water rate includes 0.01KM/ M<sup>3</sup> for tax.

<sup>29</sup> Monthly meter charge varies based on size of meter. Larger meters pay a higher charge.

<sup>30</sup> Meter charge for non-residential customers only.

<sup>31</sup> Monthly meter charge varies based on size of meter. Larger meters pay a higher charge.



**TABLE VI – 2****Vodovod Revenue Collection Rates for 1998**

<b>Vodovod</b>	<b>Residential</b>	<b>Commercial</b>	<b>Industrial</b>	<b>Total (Estimated)</b>
Konjic	67%	-	40%	55%
Cajnice	-	-	-	10%
Zenica	10%	22%	-	17%
Banja Luka	77%	62%	85%	82%
Srbac	11%	-	27%	15%
Tuzla	27%	-	39%	30%
Gradacac	50%	40%	40%	45%
Orasje	-	-	-	40%
Bijeljina	-	-	-	50%
Celic	-	-	-	60%
<b>Average Rate of Collection of Amounts Billed</b>				<b>40%</b>

TABLE VI-3

## SUMMARY OF 1998 EXPENDITURES OF SELECTED VODOVODS (KM 1,000)

Type of Expenditure	Gradacac		Bijeljina		Zenica		Srbac		Konjic	
	Cost	%	Cost	%	Cost	%	Cost	%	Cost	%
Materials	296	17	320	20	505	9	56	12	148	19
Electricity	275	16	120	7	137	2	70	15	12	2
Spare parts, stores	19	1	19	1	159	3	12	3	1	0
Depreciation	340	19	180	11	2,050	38	63	14	400	52
Personnel	490	28	406	25	1,200	22	150	33	180	23
Transportation	90	5	13	1	1	0	1	0	0	0
Maintenance, repair	166	9	65	4	465	8	5	1	0.5	0
Rent	0	0	0	0	1	0	4	1	6	1
Taxes	4	1	125	8	4	1	5	1	0	0
Miscellaneous	77	4	59	4	930	17	89	20	28	3
Capital investments	0	0	302	19	0	0	0	0	0	0
<b>TOTAL</b>	<b>1,757</b>	<b>100</b>	<b>1,609</b>	<b>100</b>	<b>5,452</b>	<b>100</b>	<b>455</b>	<b>100</b>	<b>775</b>	<b>100</b>

Type of Expenditure	Banja Luka		Tuzla		Orasje		Celic		Average% of Cost Items
	Cost	%	Cost	%	Cost	%	Cost	%	
Materials	306	5	652	9	24	6	50	14	<b>10</b>
Electricity	630	11	1,313	17	90	24	27	7	<b>11</b>
Spare parts, stores	40	1	11	0	1	0	3	1	<b>1</b>
Depreciation	1,244	22	2,800	35	82	22	12	3	<b>29</b>
Personnel	1,500	26	2,200	28	100	27	58	16	<b>26</b>
Transportation	5	0	4	0	2	1	8	2	<b>0.5</b>
Maintenance, repair	97	2	106	1	5	2	0.1	0	<b>3.5</b>
Rent	0	0	100	1	0	0	0	0	<b>0.5</b>
Taxes	0	0	29	0	1	0	1	0	<b>0.5</b>
Miscellaneous	1,912	33	605	8	67	18	140	39	<b>16</b>
Capital investments	0	0	74	1	0	0	64	18	<b>1</b>
<b>TOTAL</b>	<b>5,734</b>	<b>100</b>	<b>7,894</b>	<b>100</b>	<b>372</b>	<b>100</b>	<b>363</b>	<b>100</b>	<b>100</b>

**Notes:**

1. "Taxes" does not include major new taxes imposed effective 1 January 1999
2. "Personnel" includes wages and benefits
3. "Miscellaneous" includes advertising, insurance, entertainment, telephone, interest, and other costs.
4. In Zenica, Miscellaneous includes DM 561,000 in accounts receivable that were written off in 1998.
5. In Banja Luka, the large amount under "Miscellaneous" may represent a reassessment charge.

**TABLE VI – 4**  
**Cash Flow Summary<sup>32</sup>**  
**Statement of Sources and Uses of Funds, 1998 (KM 1,000)**

	Konjic	Zenica	Banja Luka	Srbac	Tuzla	Gradacac	Orasje	Bijeljina
<b>Sources of Vodovod Funds</b>								
Profit/ (Loss) <sup>33</sup>	(331)	(210)	(2,797)	1	(1,238)	2	(12)	1
Depreci- ation <sup>34</sup>	402	2055	1,244	63	2,819	340	161	176
Current Assets <sup>35</sup>	(143)	1,693	330	(8)	(548)	2	(186)	187
<b>Total Sources<sup>36</sup></b>	<b>(73)</b>	<b>153</b>	<b>(1,883)</b>	<b>55</b>	<b>1,034</b>	<b>344</b>	<b>(37)</b>	<b>364</b>
<b>Uses of Vodovod Funds</b>								
Fix. Asset Additions <sup>37</sup>	1,069	209	8,843	179	5,888	91	19	(16)
Current Liabilities <sup>38</sup>	(12)	1	(33)	20	983	253	(56)	(33)
(Increase) Decrease in Capital <sup>39</sup>	(1,129)	(57)	(10,693)	(144)	(5,837)	-	-	413
<b>Total Uses</b>	<b>(73)</b>	<b>153</b>	<b>(1,883)</b>	<b>55</b>	<b>1,034</b>	<b>344</b>	<b>(37)</b>	<b>364</b>

**Note:** This statement is largely for financial analysts. It requires that Sources and Uses balance. Items such as profit/loss and depreciation are actually results recorded for the year 1998, while most others are the increase or decrease relative to fiscal (calendar) years 1997 and 1998. The results are less meaningful in Bosnia than for typical utility operations because (1) it reports *amounts billed* as sources, but the ten pilot vodovods had *revenues received* of only 40% of the amounts billed, on average; and (2) the uses category is heavily skewed by funds received from the donor community.

<sup>32</sup> Financial data for Cajnice and Celic not received in time for inclusion.

<sup>33</sup> Profit or loss as shown on the vodovods' P&L statements. These are based on revenues billed, not collected.

<sup>34</sup> Amount of funds that normally would be available for capital investments, so are shown as sources of funds. However, most vodovods were unable to collect sufficient revenues to allocate for this purpose.

<sup>35</sup> These are liquid assets, including cash, accounts receivable and inventory of materials. It indicates the change from the previous year.

<sup>36</sup> This figure represents the total sources of funds that would normally be available to a utility to meet its various requirements. That assumes that the utility collects most of the funds billed its customers, so clearly most vodovods are in very poor financial condition.

<sup>37</sup> This category also includes the value of donations from the international donors. Since these funds are external from the normal sources of funds, they are balanced by the category below for Increase or Decrease in Capital.

<sup>38</sup> This is the increase/decrease from 1997/1998 in accounts payable plus other short-term debt. Some vodovods carry an item for liability reserves which is also included in this line item

<sup>39</sup> This is the increase/decrease from 1997/1998 in capital. Essentially this is the amount of donor contributions received in 1998.

**TABLE VI-5****Accounts Receivable Turnover and Collection Period, 1998**

	Konjic	Zenica	Banja Luka	Srbac	Tuzla	Gradacac	Orasje	Bijeljina
Year End 98 Accounts Receivable	278	7,079	676	253	9,232	743	479	927
Total 1998 Billed Revenue	343	5,652	4,533	516	7,845	1,858	699	2,621
Accounts Receivable Turnover	1.2	0.8	6.7	2.0	0.8	2.5	1.5	2.8
Collection Period in Days	296	457	54	179	430	146	250	129

## Notes:

1. Accounts Receivable Turnover is the ratio between annual revenue *billed* and the total amount of accounts receivable outstanding at the end of the year. A Turnover of from 6 to 12 is generally considered acceptable.
2. The Collection Period in Days is the average number of days between the time bills were sent to customers and payment was received. A normal range for this period is from 30 days (good) to 90 days (poor).

**TABLE VI-6**  
**Liquidity Ratios, 1998**

	Konjic	Zenica	Banja Luka	Srbac	Tuzla	Gradacac	Orasje	Bijeljina
<b>Current Ratios</b>								
With A/R	5.3	63.6	2.6	3.6	5.4	3.0	1.2	5.1
W/O A/R	2.0	13.2	1.4	0.8	1.1	1.2	0.2	1.5
<b>Acid Test</b>	0.1	2.6	1.5	0.4	0.3	0.1	0.0+	1.1

Notes:

1. Current Ratio is the ratio of current assets (cash, accounts receivable and inventory of materials) to current liabilities (accounts payable and short-term debt). The higher the ratio, the greater liquidity the utility has.
2. Because the level of accounts receivable (A/R) are so great, this ratio is shown with and without the accounts receivable. The high level of receivables gives a false picture of the utilities' current ratio and liquidity.
3. The higher the Current Ratio the greater liquidity a utility has.
4. The Acid Test is the ratio of current assets, less inventories of materials, by the current liabilities. This is a stricter measure of liquidity because it measures the availability of funds without having to sell any of the utility's inventory. The Acid Test ratios indicated are based on current assets without the receivables.
5. Acid Test ratios should exceed 1.0

**TABLE VI-7****Profitability Ratios, 1998**

	Konjic	Zenica	Banja Luka	Srbac	Tuzla	Gradacac	Orasje	Bijeljina
<b>Operating Margin</b>	-97%	-13%	-14%	0%	-16%	0%	-2%	0%
<b>Net Worth</b>	9	46	33	1	72	7	2	8
<b>Assets/Net Worth</b>	0.9	0.8	0.9	0.9	0.9	0.9	0.95	0.9

## Notes:

1. Operating Margin is the ratio of the amounts billed to customers, less operating expenses, to the total amounts billed; expressed as a percentage. Operating costs include depreciation. This is a measure of the utilities' profits, assuming they collected all amounts billed to customers.
2. Many vodovods are not billing enough to cover their full operating costs (including depreciation), so that is the reason for the negative operating margins.
3. The comparison shows that even if the utilities had been able to collect the revenues needed to cover depreciation, none would have made a profit. Since they collected, on average, only 40% of the amounts billed, the picture is even worse than indicated.
4. Net Worth, expressed in millions of KM, is the total capital or equity of the utility. This represents the value of Fixed Assets, less any debt the utilities may have.
5. The ratio of Assets to Net Worth is essentially the ratio of the utilities' fixed assets to their capital or equity (fixed assets less debt). A ratio of 1.0 indicates no debt, and is the highest possible amount. The greater the debt, the lower the ratio. These relatively low ratios indicate, which is the case, that the utilities have very little debt.

## CHAPTER VII PRIVATE SECTOR PARTICIPATION

### 1. Views and Current Practices Related to Private Sector Participation

- a. Government, USAID and World Bank Positions on Private Sector Participation The Government has indicated an interest in pursuing privatization of the water and wastewater sector, and Republika Srpska has designated five municipalities<sup>40</sup> where private sector participation options should be pursued. USAID, the World Bank and other donors, as a matter of policy, strongly support the concept of private sector participation in the water sector as a viable means of improving the quality of the provision of water and wastewater services. Some of the most common private sector participation options available for consideration are summarized in Section 2.
- b. Current Experience in GoBiH with Private Sector Participation A fair number of vodovod tasks are now being subcontracted to the private sector. Some of the examples among the ten vodovods visited include:
  - " **Zenica** Replacement of water meters (see Chapter IV, Section 4.f)  
Development of a management information system  
Uses a private accounting firm to set up and maintain its customer accounting system
  - " **Banja Luka** Uses private legal services to collect outstanding revenues
  - " **Tuzla** Used a private contractor to set up a computerized system to monitor key operational functions of their water system. They also outsource much of their construction and repair work.
  - " **Konjic** Uses a private specialist to maintain the computers and programs they use for their accounting system
  - " **Celic** All public services to 12 communities in this municipality are being provided in a form of management contract to two private sector companies. One of these companies further sub-contracts all of its financial functions to a licensed accountant. However, this is not a useful example as there are many problems. (See Appendix B for the background of privatization in Celic.)

### 2. Private Sector Alternatives for Water and Wastewater Utilities

The most common forms of private participation in the sector are summarized below. References to the "utility" can refer to national, district or municipal sector organizations, but generally are most commonly directed at municipal or regional water and/or wastewater utilities. The "owner" can be the utility itself, or it may refer to a municipality, a province or district, or an agency of the national government, which essentially owns the utility.

- a. Service Contract The utility contracts with the private sector to take responsibility for specific functions such as metering, billing and collecting revenues; maintaining large equipment units or electronic or master metering equipment; repair of water pipe leaks or wastewater piping failures; or other functions as appropriate. Time period is a few years, and payment methods vary.
- b. Management Contract ("Affermage") The utility (or its owner) retains ownership of the system and its facilities, and retains the power over establishing the service tariff rates, but contracts with a private sector firm for the management and operation of the entire utility. Time period is usually for 10 to 15 years, with a typical minimum of 5 years, renewable at the option of the utility. Payment is

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<sup>40</sup> Banja Luka, Bijeljina, Caijnice, Gradiska and Zvornik. The first three are included in the pilot program.

usually set as a basic fee plus incentives for achieving a range of measurable objectives, such as reducing water losses and accounts receivable, increasing collections, and maintaining specified levels of service (water pressure, hours per day that water is delivered).

- c. Lease Contract (“Concession”) Similar to the Management Contract, but the private sector contractor also finances mutually agreed capital investments over the period of the contract. To allow recovery of such costs, the time period is usually in the order of 25 to 30 years, and payment incentives must be suitable to ensure the repayment of the investments made. Fees for operation and management, as described under Management Contract, are also incentive-based. Contractor-constructed facilities are transferred to the owner at the end of the contract period.
- d. Build, Operate, and Transfer Contract (“BOT”) The private sector contractor constructs, finances and operates specific facilities such as water or wastewater treatment plants, under contract with the utility, and operates and manages them or the entire system. To allow recovery of such costs, the time period is usually in the order of 25 to 30 years, and payment incentives must be suitable to ensure the repayment of the investments made. Fees for operation and management are incentive-based, as described under Management Contract. Contractor-constructed facilities are transferred to the owner at the end of the contract period. A variation of this type of contract is to transfer the newly-constructed facility to the owner as soon as it is completed, with payments adjusted accordingly.
- e. Investor-Owned Facilities Private investors may build, operate and own sector systems, frequently in support of private sector investments such as tourist resort communities or other developments being financed by the private sector. Major municipal systems are also sometimes privately owned.

### **3. Privatization vs. Private Sector Participation**

- a. Confusion of the Two Terms The terms “privatization” and “private sector participation” are sometimes used interchangeably. For the purposes of this report, privatization is considered to mean the selling of government assets and the assignment of responsibility to a non-governmental (private) owner; while private sector participation means the assignment of previously governmental tasks, usually by contract, to a non-governmental (private) owner. This latter procedure is sometimes referred to as “outsourcing”.
- b. Privatization The selling of government assets to, and/or the investment of assets by, a private owner entails considerable risk to both parties, and long-term (25 to 30 years) commitments. A “Lease Contract” is a form of privatization.
- c. Private Sector Participation Private sector participation in the form of contracting of tasks to private sector companies, or outsourcing, entails much less risk while still taking advantage of private sector skills and efficiencies. The services to be provided can usually be specified fairly clearly, performance of services can be monitored, and the length of contracts is frequently limited to from a few to up to 15 years. “Service Contracts” and “Management Contracts” are forms of private sector participation.



#### **4. Suitability of These Alternatives in Bosnia and Herzegovina**

- a. Privatization or Sale of Assets At the present time, there are no active proponents for privatization in GoBiH. Privatization alternatives are more likely to be utilized only when enterprises are in reasonably good condition, and this may not be the best option for consideration by Bosnia at this time.
- b. Management or Lease Contracts The larger cities in the country may be potential candidates for these contracting alternatives, but the existing condition of most vodovods, regardless of size, makes them questionable candidates for this form of private sector participation at this time. The World Bank is considering the use of a management contract for the (soon-to-be) unified Mostar vodovod, in conjunction with a significant loan for rehabilitation of water and wastewater facilities. Of the ten vodovods studied, Banja Luka and other larger vodovods might be considered possibilities in the foreseeable future.
- c. Service Contracts or Outsourcing Opportunities Consideration should be given, after technical and economic analysis, to the award of service contracts for those functions which any of the vodovods find difficult to perform, usually because of a lack of needed materials and equipment, or scarce personnel skills; or in functions where the private sector may be more cost effective. Such contracts could be useful parts of any proposed strengthening programs for the vodovods. Typical activities selected for outsourcing include (1) engineering services for the preparation of plans, specifications and contract documents, and supervision of construction of major capital works projects, (2) testing and laboratory services, (3) meter purchase, installation, maintenance and reading, (4) accounting, billing and collection procedures, (5) repair and/or maintenance of major equipment, electronic devices, electric motors, vehicles or other complex equipment, (6) repair of water pipe line leaks or breaks or wastewater sewer blockages or breaks, (7) public relations and information campaigns, or other functions which are now the responsibility of the employees of the sector enterprises.

#### **5. Private Sector Possibilities for Local Manufacture of Sector Commodities**

There is a large demand for new or rehabilitated water meters of varying size and types in the country. The Government may wish to consider undertaking a study to determine the economic or other advantages of encouraging foreign meter manufacturers to construct meter manufacturing plants in Bosnia. The emergence of two or more competent, competitive manufacturers in this field might be of major benefit to the development of the sector. Alternatively, private sector rehabilitation and reconstruction of existing meters, as is practiced now in Zenica, might be expanded to allow this service to be provided by another company so as to provide competition. Development of privately owned local manufacturers of other sector materials, such as pipelines, valves, motors, pumps and plumbing fixtures, should also be evaluated and encouraged if found to be economically feasible.

## CHAPTER VIII INSTITUTIONAL RECOMMENDATIONS

### 1. Priority Needs for Institutional Strengthening

- a. Fundamental Attributes of Effective Sector Utilities Over ten years ago USAID, through the WASH program, commissioned a study of two successful water and wastewater utilities in emerging countries<sup>41</sup>. The scope of this study was to determine the most important attributes that made them successful. The evaluations of the two utilities were conducted independently, yet both concluded that the three critical requirements for success were:
  - (1) *autonomy*, or the ability to operate with minimum control from any governmental body, but with necessary oversight and regulation,
  - (2) *leadership*, or the presence of a utility manager who practiced good management skills, had the respect of his employees and the community, and who knew every facet of the operations of the utility, and
  - (3) *a business-like approach*, meaning the utility, although public, operated just as though it was a private business, in terms of its efficient system of billing and collecting revenues, financial self-sustainability, planning and budgeting, and treatment of the users of its services as true customers.
- b. Need for Focus on Critical Weaknesses All ten vodovods studied have serious institutional weaknesses. This is hardly surprising, given the combination of (1) a fairly recent transition from a socialistic system, (2) the major disruptions and damage caused by the war, and (3) the very fragile state of the country's economy. The need for extensive strengthening and the limitations of funding and human resources are such that it is critical to address priority problems. The first stage of strengthening efforts should be directed at resolving those problems that threaten the basic viability of the vodovods. Similarly, the priority institutional strengthening efforts must closely support the priority financial strengthening efforts, as neither will succeed alone.
- c. Proposed Priority Areas for Institutional Strengthening Many of the problems found in the vodovods relate to the lack of control they have over how they operate. Some form of *increased autonomy* is absolutely essential if basic institutional and financial strengthening efforts are to have a reasonable chance of success. One of the most critical problems is billing and collection of revenues. That problem is greatly exacerbated by the lack of functioning meters. Achieving an *effective metering program* has to be a second priority. Most vodovods have such weak programs of metering of either their sources or their customers, that they have no means of reliably estimating their water losses. In the few vodovods that have reasonably reliable metering of sources and customers, unaccounted-for-water (UFW) rates appear to be in the order of 50%. It seems likely that conditions are considerably worse in those vodovods with less effective metering. Uniformly, vodovod personnel equate UFW with leakage, but with high rates of non-payment of bills, and the large number of non-functioning meters in many places, wastage is probably a major component of UFW, together with water diverted through illegal connections. Vodovods cannot effectively attack the problem of UFW until they develop the capability to more reliably determine its components. Accordingly, the third suggested priority program is to develop and implement programs of *demand management* to assist the vodovods in reducing UFW levels. The fourth and final priority program is to develop and implement a means of improving the vodovods' *shutoff capabilities*, both technically and administratively, to allow the vodovod to more effectively cut off the supply of water to its non-paying users, with emphasis on industrial, commercial and public sector customers. A credible threat of loss of service will do more for the improvement of the rate of revenue collection than any

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<sup>41</sup> WASH Technical Report No. 37: "Guidelines for Institutional Assessment of Water and Wastewater Institutions", February 1988. (WASH: Water and Sanitation for Health)

other action. This need is directly tied to the first financial priority of increasing revenue collection, so it should be linked with that effort in determining overall priorities.

- d. Other Programs for Strengthening This chapter presents other recommendations for badly needed institutional strengthening, but most of them are considered to be of less urgency than those mentioned in the previous section. While programs such as the development of a *customer relations capability* may appear to be a relatively low priority, there is almost certainly a link between the almost complete absence of such a capability and the relatively poor collection rate that now plagues most vodovods. This and other programs that relate in part to the resolution of current critical problems may deserve upgrading to a higher priority.

## **2. Increase the Autonomy of the Vodovods (First Priority)**

- a. Long Term Recommendations Chapter V sets forth the extent of the control municipalities currently exert over the vodovods, and the detrimental consequences of this control. Chapter II describes the efforts being undertaken to implement sector reform at the national levels. National sector reform is imperative if the vodovods are to have any chance of providing water and wastewater services to the people of Bosnia and Herzegovina in an effective, self-sustaining manner. The donor community should designate sector reform as a matter of great urgency, and should give serious consideration to making such reform a condition of providing continued assistance to the sector.
- b. Short Term Recommendations Even with supportive efforts by the donor community, it must be recognized that it will be some time before comprehensive sector reform and the concomitant granting of autonomy to the vodovods can be expected. The provision of greater autonomy to vodovods cannot wait if the proposed strengthening measures are to have the intended effect. It is recommended that, until sector reform is achieved, the donors make it a condition of any future programs of assistance that the subject municipality and vodovod enter into a legal agreement which provides the vodovod with such autonomy as may be permitted within existing laws and regulations. It is further recommended that a study be undertaken to investigate this matter, and develop a suggested form of agreement that could be used for this purpose.
- c. Reorganization Within the Municipality As part of the “interim” program of providing greater autonomy, the proposed study also should address how best to restructure the existing pattern of organizational relationships between the municipalities and the vodovods.

## **3. Implement an Effective Metering Program (Second Priority)**

- a. Components of an Effective Metering Program To be truly effective, a metering program must not only have functioning meters on all water sources and on all customer connections, but it also must include such elements as establishing and implementing programs for the following:
  - (1) The early identification and prompt removal and replacement of non-functioning meters,
  - (2) The periodic (as frequently as six months to a year for the largest meters down to about five years for small residential meters) removal and re-calibration or repair of large and small meters,
  - (3) The selection (from at least two different manufacturers, for competitive reasons) of meters of a type that are suitable for local conditions at a reasonable price,
  - (4) The calibration, repair and/or rebuilding of meters of the type and capacity of those in the system, and
  - (5) Reading and recording data from all meters in a timely and accurate manner (with an oversight capability to ensure compliance).

The means of making use of the data collected from the customer meter readings are covered under the financial recommendations.

- b. Source Metering It will be expensive to provide meters on presently unmetered sources, so this should be achieved over time. However, in all cases, vodovods should improve their efforts to determine with greater accuracy how much water they are producing. Flows can be measured economically from time to time by using tools and devices for making taps and installing stopcocks, and then inserting a portable device for measuring the flow. Once installed, the stopcock becomes a permanent part of the pipeline. If the utility wants to recheck flow being transmitted in that pipeline, they can reinsert the portable flow meter in the pipeline. Portable flow meters could be shared among several vodovods, and personnel would need to be trained to operate them. Such measured flows are far more accurate than estimating flows from nameplate data on pumps, or using the design capacity of transmission pipelines, as is now common. Systems would also have to be developed to ensure that an accurate record of the daily hours of operation (of wells, for example) are maintained and reported to management. A study should be made (by local specialists, with overall guidance from an experienced expatriate) in each vodovod to determine how best to improve source measurement, and the recommendations of these studies could be provided to donors for their consideration.
- c. Metering of Large-User Customer Consumption An old rule of thumb for western water utilities states that about one fourth of the customers use three fourths of the water. In Sofia, Bulgaria, five percent of the customers (the largest users) account for 60% of all water consumed. The present state of the economy in this country has diminished industrial activity so that the largest users do not account for as much water as they did formerly. Nevertheless, the principle holds, and vodovods should ensure that the provision of reliable meters to larger users is made a priority. This includes every category of customers except those for small (one or two family) residential customers. Studies should be undertaken in each vodovod, with external assistance, to determine the status of metering for potentially large water users, and to conduct an estimate of the numbers and costs of required replacement meters, as well as a 20% reserve and a supply of spare parts.
- d. Metering of Small Residential Customers Providing meters for small residential dwellings should be established as having a relatively low priority. Based on actual test studies and the results from the few vodovods with reasonably reliable metering, actual per capita water use is estimated to range from about 175 to 250 lpcd. In the absence of any other means of estimating usage (such as basing consumption on the results of a previously operating meter), bills delivered to non-metered residential customers should be estimated on the basis of not less than 150 lpcd, (and more probably 200 lpcd) and (in the absence of hard data) an estimated four persons per family. For those customers who strongly contest such estimates, a supply of meters should be made available for installation for a period of not less than six months, and future billings should be estimated on the results of the actual metering. Vodovods should be able to implement this recommendation without assistance, but may need help in procuring enough meters for verification and resolution of customer complaints.
- e. Programs for Monitoring, Periodic Replacement, and Calibration and Repair of Meters Technical assistance should be provided to develop a general program for these areas of strengthening, which should then be tailored to suit the specific needs of each vodovod. Calibration, repair and rebuilding of meters probably would be more economically provided at a few regional centers, rather than trying to establish it at a large number of vodovods. There is already a good private sector capability for this at Zenica. The study should determine how best to expand this capability, with emphasis on doing so as a private sector activity. Monitoring and reporting of non-functioning meters could be improved immediately within existing vodovod capabilities. Removal and replacement programs would depend on the rate at which replacement meters could be made available.

- f. Programs for Prompt, Accurate Meter Reading and Transmittal of Reading Results One of the financial recommendations is for more frequent reading of residential meters, from the present schedules which range from quarterly to annually, to a proposed schedule of monthly or bi-monthly. Programs should be developed with external assistance to assist the vodovods in meeting these objectives with minimum impact on staffing levels. These programs also should make recommendations to ensure efficient, prompt and accurate results throughout the entire sequence of meter reading, transfer of readings, and billing of customers.

#### **4. Develop Demand Management and UFW Reduction Programs (Third Priority)**

- a. Definition of Demand Management and Goals for Reducing UFW Demand management is a series of procedures or actions to assist the vodovod in reducing leakage, illegal connections, and waste, and promoting water conservation. The difference between the amount of water produced and the amount it can account for in billings is defined as unaccounted-for-water. Reasonable levels of demand assume that the utility provides only so much water as its customers need and are willing to pay for. The most efficient of utilities have UFW levels of about 10%, but such low levels are rare. For Bosnia and Herzegovina, a UFW level of 30% is believed to be a reasonable, achievable intermediate goal for most vodovods. Reducing UFW below that level would indicate excellent management.
- d. Components of Demand Management and UFW Reduction Programs Typical components of a demand management program include: (1) reliable metering of both sources and customers, (2) assignment of responsibility and resources to locate illegal connections and either convert or eliminate them, (3) assignment of responsibility and resources for location and repair of as many system leaks as possible, (4) assignment of responsibility and resources for eliminating “administrative” losses, the tampering of the process of meter readings and or billings by dishonest employees within the utility for personal gain, (5) the establishment of step tariffs to make water more expensive as the amount of usage increases, (6) the implementation of water conservation programs, and (7) such other activities as may be appropriate in particular situations.
- e. Benefits of Demand Management Clearly it costs money to produce water, in terms of chemicals, energy, the capital cost of providing the capacity of pipelines, reservoirs, pump stations and treatment works, and the staff to maintain them. Water conserved frequently means that capital costs for expansion works to meet the demands of uncontrolled water use can be deferred. Water not wasted in buildings means reduced loads on wastewater systems, and similar savings in operating costs or deferred capital expenditures.
- f. Recommendations External assistance should be provided to develop a general program for demand management applicable to current conditions in the country’s vodovods. The program should then be tailored to meet the individual needs of the ten vodovods.

#### **5. Develop and Implement a Program to Facilitate Shutoffs (Fourth Priority)**

- a. Legal Basis for Vodovods to Refuse Services for Non -Payment Many vodovod directors complained that their mayors, or at times officials at higher levels, ordered them to reinstate service after they had shut off water for non-payment, or refused their requests to cut off service to blatant non-payers. Some said these officials told them it was illegal to do so. That is not so. Banja Luka has done so successfully, and they said such actions were permitted by the RS regulations. They have been tested in court, so it is presumed that the laws of the RS support shutoffs. In the RS, regulations governing the work of public utility companies (including vodovods) in municipalities are set forth in the “Law on Public Utility Services 1995” which was printed in the Official Gazette of the RS, No. 11/95. In the FBiH, similar regulations are set forth in the “Law on Public Utility Services 1990”, printed in the Official Gazette of the SR (Socialist Republic) BH, No. 20/90. It is also in the “Law on Basic Principles of Local Self-Governance”, printed in the Official Gazette of

the FBiH, No. 6/95. The FBiH Law on Public Utility Services (Article 11, Paragraph 2, Item 3) stipulates that the supplier of services may refuse to deliver services to those users who do not pay their bills for two consecutive months. Before the supplier cuts off such service it must prove that it does not prejudice the rights of others who are paying regularly for their services. This condition protects the rights of people in apartment buildings who pay for their services from the loss of services in cases where a neighbor has not paid. This law clearly provides a sound legal basis for vodovods in FBiH to cut service for non-payment to all customers except those who share a connection. It seems probable (given the Banja Luka experience) that the laws of the RS are similar in this regard, but no corresponding references were found for the RS law.

- b. Develop and Implement a Strategy to Allow Vodovods to Refuse Service for Non -Payment Without Interference From Municipal Officials Ensure that this right is granted to the vodovods in the agreements with the municipalities recommended in Section 2b of this chapter. Use external assistance to develop a strategy to allow the vodovods to make use of these powers, and to assist the vodovods in implementing that strategy. This strategy should include the drafting of a new “shutoff policy” which sets forth, within the law, the specific conditions under which the vodovod plans to exercise this power, and measures for the publication and explanation of this policy.
- c. Develop a Program to Physically Facilitate Shutoffs Vodovod staff should make an inventory of all customer connections to determine either the location or absence of shutoff valves or other means of disconnecting the non-paying user, whether the valves or other means function, and whether the valves or other means of interruption can be protected against unauthorized reconnection by others. The first priority is to determine this information for industries, commercial facilities, public buildings and apartment or multifamily buildings (even though the latter appear to be exempt from shutoffs). Basic drawings should be prepared to indicate this information for those types of users. Vodovods should list all actions, equipment or facilities needed to ensure that these categories of customers can be provided with effective, secure shutoffs, and the cost of installing such devices. As a lower priority, similar efforts should be undertaken to provide this information for the connections to small residential users.
- d. Implement the Program to Facilitate Shutoffs to Major Users Use the same external assistance described under paragraph “b” above to review the vodovod’s proposals, and determine how best to implement the construction of any works required to facilitate shutoffs to major users. Include the cost of the technical services and the construction of the approved shutoff facilities in the strengthening program.

## **6. Additional Programs for Institutional Strengthening**

The following programs, while of relatively lower priority, indicate areas that also should be strengthened to allow the vodovods to function effectively. Many of the recommended strengthening measures could be devised generally for all vodovods, and then adapted to the specific needs of each. Decisions on the details of how best to provide these services should be made in conjunction with the availability of funds, and the interest of the vodovods in receiving assistance for particular areas of concern to them.

- a. Separate Other Communal Services from Water and Wastewater Services Just half the utilities studied provide only water and wastewater services. In those cases, other municipal services are provided by a communal public services organization, parallel to the vodovod. The provision of these sector services is a difficult task, requiring management that is knowledgeable and dedicated. Experience in other countries indicates that water and wastewater services are best provided when management is not diverted from this important function. It is recommended, as a part of the national sector reform program, that water and wastewater services be provided to each municipality by a true vodovod, with responsibility for only those services.

- b. Internal Reorganization Some of the vodovods studied were organized in a manner that left room for considerable improvement. It is suggested that existing tables of organization be reviewed for all ten vodovods, and that suggestions be offered to vodovod directors for making improvements. While not all vodovods should be organized the same way, advice regarding reorganization should be coordinated to ensure that basic principles are agreed on before the advice is tendered.
- c. Development and Implementation of Management Information Systems Most vodovods recognize that they are deficient in this area, and many asked for assistance in improving their capabilities. Assistance in achieving improvement is best achieved in two steps. The first is for specialists in sector utility management and operations to determine what types of information can and should be gathered, how it should be recorded, who should receive it, and in what form and how often (abbreviated, detailed, frequency) they should receive it. The second step is to have a MIS specialist develop a computer-based program to achieve the established objectives, and to train vodovod staff in operating the system. Hardware and software will probably be required for this function, as the few computers now available to vodovods are usually dedicated to the financial sector.
- d. Develop and Implement a Customer Relations Capability To the extent that vodovods have any capabilities in customer relations, it is focused almost entirely on dealing with customer complaints, the great majority of which are related to their bills. It is proposed that specialists in customer relations (one local, one expatriate) develop a phased program. This program should be designed to provide the vodovods with an improved capability that embraces the following programs:
  - (1) Keeping customers informed,
  - (2) Make it simpler for them to contact the vodovod on any matter of concern,
  - (3) Provide for prompt follow-up and action on all customer complaints,
  - (4) Devise a specific strategy designed to change customer attitudes about water use (and waste) and the importance of payment for services, and
  - (5) Such other positive and pro-active customer relation activities as are considered appropriate for local conditions.
- e. Personnel Management and Training Personnel management procedures are rudimentary at best at this time, and the current financial situation in all vodovods precludes the provision of significant training of staff. This must change. It would be helpful to prepare a basic, appropriate program for personnel management and training. The recommendations should describe the minimum components of such a program. This includes the type of personnel records to be maintained, who should maintain them, measures for protecting confidentiality, procedures for periodic evaluation, systems for motivation and advancement, identification of training needs, and such other components as may be appropriate for an autonomous sector utility in the local environment.
- f. Conduct Energy Audits Electricity costs for several of the vodovods where data were available ranged from 15% to 30% of their total cash expenditures in 1998. Energy bills are a major item of debt for many vodovods. It would be helpful to utilize the services of a specialist to draft a program containing the procedures for conducting an energy audit of the vodovods' facilities. The program should also include guidance on the use of the results of that audit to determine (economic justification) what steps should be taken to reduce their energy costs. Banja Luka recently hired an electrical engineer to conduct an energy audit. The results of the efforts in Banja Luka should be taken into account in developing such a program.

- g. Improve Mapping Capabilities Maps showing system facilities are in short supply. The vodovods would greatly benefit from a program to assist them in preparing basic, reproducible drawings of their principal facilities. Technical assistance is proposed to study the needs and determine how best to provide an initial set of reproducible system maps, and guidance on how to ensure that they are updated periodically to ensure currency. This assistance should also extend to guidance on the preparation of maps and data sheets for the location of valves in water mains and manholes in sewers. The use of GIS (geographical information systems) techniques should also be explored as a possible means of improving the vodovods' capabilities for system mapping and the location of physical facilities.
- h. Develop Programs for Improving Operation and Maintenance Practices The first step should be to ensure that any future capital assistance programs provided by donors include the requirement that operation manuals (which include maintenance instructions and schedules) be provided to the recipient vodovod, and that such manuals be in the local language appropriate for use by staffs throughout the country, as appropriate. It would also be helpful to conduct an inventory of all existing facilities to determine the needs for basic operating and maintenance guidelines. Vodovod staff should be requested to prepare a draft of this inventory. A team of local and expatriate specialists could then review the inventory, and prepare operation and maintenance guidelines appropriate to the needs of the facilities and the vodovods. In addition to the guidelines, the specialists should develop procedures for collecting and reporting information on when specific operational and maintenance functions should be performed, and confirmation that they have been performed. These procedures should be provided as input to the MIS specialists.
- i. Develop a Planning Capability Most vodovods have serious deficiencies in their systems that require replacement or extension into unserved areas. Technical assistance could be utilized to provide the vodovods with a disciplined study of their existing and possible future needs; technically and economically appropriate facilities or other actions proposed to meet those needs, listed by priority; and an estimate of both the capital and operating costs related to each improvement. Studies such as these could be useful guides for donors interested in participating in the sector.

## 7. **Broad Based Programs to Support the Sector**

- a. Develop a New Sector Support Organization Several of the vodovods have developed procedures and adopted practices which could be applicable in other vodovods, but there is presently no mechanism for sharing such useful information. In addition, as the vodovods share similar problems such as lack of autonomy, difficulty in collecting receivables (bills issued but not paid) and the unfairness of the several taxes levied by governments against them, they could more effectively seek redress if they spoke with a unified voice. It is suggested that assistance be sought, possibly in conjunction with support from the American Water Works Association (AWWA) or a suitable European model of a water and wastewater support organization, to develop a similar Bosnian support organization. The study should cover such matters as an evaluation of the value of such an association to the water and wastewater sector. This includes staffing and annual costs required to maintain it, where it should be located, how to make it responsive and acceptable to vodovods in both RS and FBiH, and a suggested list of activities for it to undertake.
- b. Conduct Studies of Income and Expenditures and/or Ability/Willingness to Pay The prevailing wisdom in the country is that most people are too poor to pay for water and wastewater services, so prices should be kept low and people should not be pressed for payment for the services they receive. Yet, even a casual look indicates that these costs (roughly ranging from 6 to 30 KM/month per family of four, as indicated in Table VI-1) are considerably less than the equivalent cost of a pack-a day cigarette smoking habit by only one family member (about KM 60/month). It would be a very useful tool to have available current and reliable studies of household income and what they spend it on. Obviously this information will be difficult to obtain in a country with an estimated (by



OHR) unemployment rate of 40% (and believed by many to be much higher, particularly in some areas). “Gray” market sources of income, barter of goods and services as payment rather than cash, and a wariness about responding to surveys on such sensitive matters impede any attempt to obtain accurate information. These conditions are not unknown elsewhere, and it might be useful to request a specialist to undertake a study of the problems of conducting such a survey, and make recommendations regarding the reliability of the results from it. An alternative is to conduct “willingness-to-pay surveys”, whose sophistication has increased over the years. In other countries, branches of government responsible for various aspects of the economy are often sponsors of such studies. It would be helpful to initiate discussions with the appropriate agencies in RS and FBiH to determine their interest in such studies, if conducted with financial support from donors.

- c. Strengthen the Capacity for Water Quality Testing The report concluded that water quality testing is unfocused, unregulated, of doubtful accuracy. In addition, unsatisfactory test results appear to have no effect on how the utilities operate their works. A specialist knowledgeable about the entire process of water quality regulation, testing and implementation should be engaged to provide specific guidance in this matter, basing recommendations on regulations and standards suitable for Europe. The issue of water quality is of such importance that regulations setting forth requirements and responsibilities for testing, monitoring and compliance must be carefully and completely defined. USAID and other donors should ensure that it is properly attended to in the course of sector reform.
- d. Increase Private Sector Participation Technical assistance should be utilized to make a more detailed study of opportunities for increased private sector participation in the implementation of water and wastewater services. The study should look carefully at the proposed World Bank efforts to utilize a comprehensive management contract for strengthening the Mostar Vodovod, and determine if any of the ten pilot vodovods may be candidates for similar assistance. For all vodovods, the study should recommend specific areas for outsourcing among those described in Chapter VII, Section 4c. Consideration should also be given to investigating local manufacture possibilities. A program should be developed to (1) identify those elements of the vodovods activities most likely to benefit from private sector participation, (2) prepare draft contracts for the provision of such services, and (3) prepare guidelines for the selection, payment and monitoring of any services contracted to the private sector.

## CHAPTER IX FINANCIAL RECOMMENDATIONS

### 1. Priority Needs for Financial Strengthening

- a. Identification of Most Critical Needs for Financial Strengthening The priority financial problem for most vodovods is the poor collection rate of their billings. A related problem is that the public sector entities (military, hospitals, schools, and government buildings) are one of their most delinquent customers, and they receive no support in collecting these monies. Other related problems are discussed in the institutional recommendations, including the widespread lack of functioning meters on which accurate bills can be based, and the inability of the vodovods to deny service to non-paying customers. Other critical financial related problems are the lack of a reliable and comprehensive system of accounting; the failure to generate realistic budgets and the failure to follow them when they are prepared; the heavy tax burdens levied on the vodovods billings (not just the collected revenues); and the relatively low user charges and the difficulty they have in increasing them. A final critical problem, which faces only selected vodovods, is that their antiquated computer systems face serious Year 2K problems.
- b. Strategy for Billing Customers in Apartment Buildings Develop a strategy for simplifying the matter of billing and collections from multiple customers in buildings with a single meter. Determine the possibility of delivering a single bill to the owner of a multiple family unit with a single meter, or to tenant associations if the apartments are individually owned, rather than individual families in the building. That would shift responsibility for collection to the bills from the vodovod to the owner or association responsible for the building.
- c. Proposed Priority Areas for Financial Strengthening Chapter VIII on institutional recommendations ties many of the institutional weaknesses to the vodovods' lack of autonomy over their operations. The same is true for the vodovods' control over their financial affairs, but that issue is addressed as an institutional problem to be resolved. The next sections of this chapter will make specific recommendations to address the following priority needs:
  - Increase the rate of collection of amounts billed
  - Develop effective accounting systems
  - Develop and use realistic budgets
  - Reduce current tax burdens
  - Establish more realistic tariff rates
  - Prevent Year 2K problems from occurring

### 2. Increase the Rate of Revenue Collections

- a. Adopt an Aggressive Policy of Pursuing Outstanding Bills The vodovods should consider a variety of approaches to reduce their high levels of accounts receivable. One of the most successful approaches has been used effectively by Banja Luka, whose 85% collection rate (for all amounts billed in 1998) is far above the average of the ten studied. They use the court system aggressively for large users (industries and apartment buildings), shutoff the water after two months non-payment for small business and small residences, and barter when available and satisfactory. They retain experienced lawyers who have a proven record of effectiveness in recovering revenues due. A clear collection policy should be established which sets forth the terms and penalties for non-payment, and it must be publicized and adhered to in order to ensure that customers know the vodovod is serious about payment. A specific payment period needs to be adopted and the date due placed on the customer's bill. Previous amounts owed should be presented on current bills so customers can see the total amount they owe. Commercial customers

should be given two late payment warnings. The residential customer should be allowed three warnings. Shutoffs or court action should be initiated promptly once the last warning has been ignored. Efforts should be made to deliver bills to the owners of multiple family units with a single meter, or to tenant associations if the apartments are individually owned, rather than individual families in the building. That would shift responsibility for collection of the bills from the vodovod to the owner or association responsible for the building.

- Assistance should be obtained to assist in the development of an effective billings recovery policy, and to suggest components of that policy
- Local assistance should be obtained to study the problems associated with collecting for service provided to multiple family apartment buildings

b. Pursue the Serious Problem of Non-Payment by Public Customers The vodovods will require government support to collect the amounts owed by the army and the hospital since the war. The vodovods should write off the outstanding receivables from public customers up through the end of the war, but the government should honor its debts accumulated after the war, and pay them promptly. The alternative of passing these costs along to other customers is neither feasible nor fair. A government which aggressively pursues the vodovods for taxes imposed has an obligation to pay its own debts.

- Local assistance should be obtained to determine a strategy for collecting for services provided to public customers (military, government, hospitals, and schools)

c. Reduce the Length of Time Between Billings Currently, all vodovods bill their residential customers on a quarterly, semi-annual or annual basis. They also generally bill commercial and industrial customers on a monthly basis. Increasing the billing frequency for residential customers may improve collections by decreasing the amount of each bill, making it easier to pay when the bill is due. This will also enhance the vodovod's internal cash flow because the cash payments from the customer would come in more often. The benefit of improved collections from increasing billing frequency will have to be balanced against the cost of the required extra billing and collecting efforts. In general, it seems reasonable that those vodovods that now bill their residential customers on a semi-annual or annual basis should consider billing their residential customers on a quarterly basis. Those now billing quarterly should consider monthly or bimonthly billing. To reduce the extra labor entailed in increased billing, the meter reading procedure could be changed to permit reading meters on a cycle basis, or every other bill could be prepared on the basis of estimates rather than actual meter readings.

- Assistance should be provided to the vodovods by conducting a study to determine the added cost of billing more frequently, the potential benefits, and specific actions required to accomplish meter reading and billings on a more frequent schedule, at minimum additional cost.

### **3. Develop and Implement an Effective Accounting System**

a. Establish a Uniform Chart of Accounts for Water and Wastewater Utilities A uniform chart of accounts can consist of a single chart of accounts with totally separate accounts for the water function and the wastewater function. As an alternative, two separate uniform charts of accounts could be established, one each for the water function and the wastewater function. The water and wastewater uniform chart of accounts should include a non-operating set of accounts. These accounts will be used for services provided by the vodovod that are not related to the water and wastewater operations. This chart of accounts can be adapted from international accounting organizations that have established accounts for water and wastewater, or from the uniform chart of accounts established by the National Association of Regulatory Utilities Commissioners (NARUC), a US organization, or a European counterpart organization

- Assistance should be provided to develop a model for a basic chart of accounts for use by the vodovods
- Additional assistance should be provided to tailor the model accounting system for selected vodovods, and to assist them in its implementation. This will require training of local staff to utilize the new accounting system

#### **4. Develop and Implement an Effective Budgeting System**

- Establish a Budgeting Process Based on Responsibilities Develop budgets by major department (financial, water supply, distribution) and reconcile budgeted costs to actual costs at least quarterly. This will provide management with a tool that will track the vodovod's ability to keep within estimated expenditure limits and maintain an adequate revenue stream. Reporting this by department will place the responsibility for meeting budget estimates with the head of each department. In most cases, if the department head can receive timely reports, this will help the manager to track expenditures and take any corrective actions that are necessary. The department heads should prepare a quarterly explanation for significant variances from budgeted line items. Management should approve these reports and present them to the vodovod Board of Directors for their approval and incorporation into the Board minutes.
  - Assistance and training should be provided to establish budget development and tracking policies and procedures.
  - Additional assistance should be provided for selected vodovods so that the budgeting process can be integrated into computer based accounting systems.

#### **5. Reduce Current Tax Burdens**

- Develop Opportunities for Vodovod Tax Relief FBiH and RS should change the basis of taxes applied to collected revenue as opposed to billed revenue. This will reduce the financial burden on the vodovod significantly. These taxes are currently based on the amounts billed to the vodovod customers. The amount billed by the vodovod is vastly different than the amount collected from the customer in all cases examined. The vodovod collects only 10 to 80 percent of the total. In most cases it is government agencies (army and hospital) that are contributing significantly to the vodovod's collection problem.
  - Provide assistance and support to change the tax laws for vodovods and establish a tax mechanism that is more equitable.
  - Provide additional advice and assistance to vodovods as a group, to develop lobbying practices in support of their common interests.

#### **6. Establish More Realistic Tariff Rates**

- Prepare Fully Allocated Cost of Service Studies Almost all the vodovods visited had tariffs that should be changed and rates that should be increased to cover costs. A cost of service study should be prepared by most of the vodovods and an equitable rate structure should be developed. If meters are available and working, the rate structure should have two components: (1) a customer or fixed charge; and (2) a volume related charge. The customer charge can be a lump sum or can vary based on the size of the meter or type of service. The volume rate can be uniform (most vodovods visited were using this), declining (lower unit charges as volume increases) or inclining (higher unit charges as volume increases).
  - Provide assistance to prepare cost of service studies and train vodovod staff in methods of rate design, enhancing their ability to defend prices.

- b. Establish Separate Charges for Ancillary Services The vodovods should consider charging for ancillary water and wastewater services provided to customers. Ancillary services include such items as (1) fire protection charges, (2) office service charges (late payment fees, collection fees), (3) connection and system development fees; and (4) field service charges (turn-off/turn-on, meter test). These are services that have proportionately significant costs in terms of labor and material, but are provided to only a few customers. Thus, ancillary charges seek to pass these costs onto the customers that caused the cost. In doing this, the vodovod decreases revenue required from all other customers.
- Provide assistance to identify and price ancillary charges for each vodovod.
- c. Obtain Government Support for Low or Fixed Income Families Establish a policy, with donor assistance, that lifeline or subsidized rates be set for low or fixed income customers. Reimbursement for these low rates should be provided by provided by the municipal, canton or Federal/RS governments. This will improve payments by charging amounts that the customer can afford, and allowing recovery of the subsidized rates from those who have the responsibility for providing this needed social benefit. The lower rates for this new class of customers should be part of the proposed new tariff structures to be recommended for all vodovods.
- Provide assistance to establish a separate low or fixed income customer class and prepare special rates for customers in that class.
  - Develop a strategy and legal language to require the responsible government agencies to repay the vodovod for these subsidized rates.

## **7. Prevent Year 2000 Problems Fro m Occurring**

- a. Take Action to Avoid Year 2K Problems Under the chapter on the financial assessment, three vodovods were identified as facing potential year 2K problems, largely because of the age and type of their computer systems. There may be others with similar problems, and an assessment should be conducted to determine the extent of the problem in order to avoid the loss of customer records and interruption of billing and accounting functions.
- Assistance should be provided to conduct a study of Year 2K problems in the vodovod financial systems. Priority should be given to the almost certain problems in Srbac, Tuzla and Banja Luka. Lowest priority should be given to those vodovods with only manual systems, as proposed new systems will not have any such problems.
  - Based on the suggested study, prepare guidelines for other vodovods not in the pilot study to follow, so as to permit them to determine if they have potential Year 2K problems, and to take needed actions to avoid those problems.
  - Implement the recommendations of that study as soon as possible, to avoid disruptions in those vodovods with high risk relative to Year 2K problems.

## 8. Additional Programs for Financial Strengthening

The following programs are of lower priority but all represent areas of improvement that the vodovods will eventually require to reach a desired goal of efficiency and parity with their European counterpart utilities.

- a. Require an Independent Annual Audit of Financial Reports All vodovods should have an annual audit by an independent accounting firm. The principal partners of the accounting firm should be certified to practice International Accounting Standards in Bosnia and Herzegovina using the International Standards of Auditing. They should also be members of the International Federation of Accountants (IFAC) or an equivalent European accounting association. The independent accounting firm should issue an opinion on the financial reports of the vodovod and provide detailed management notes to explain their opinions. These opinions should be made publicly available.
  - Provide assistance to strengthen existing accountant certification organizations or develop a program to create an appropriate new organization that conforms to the standards of similar European organizations
  - Draft legislation for the appropriate government bodies to require annual audits as described by certified accountants
- b. Develop and Adopt Policies and Regulations for Barter Payments National standards should be established for accounting procedures related to bartering in lieu of cash payments, and these should be followed by all vodovods
  - Provide assistance to study the extent of bartering vs., cash, and develop a fair means of estimating the value of the goods and services being offered.
  - Make revisions to the accounting system to record (1) the value of the barter item, (2) recording of the barter item so as to indicate its location, purpose, or to otherwise identify how it is serving the vodovod, (3) indicate the name of the customer who tendered the item and the value of the services provided to the customer for which the barter item is being exchanged, or such other notation in the records to ensure that the process is transparent and not being abused.
- c. Maintain Separate Accounting Records for Water and Wastewater Services Half of the utilities studied provide municipal public services other than water and wastewater. Until such time as these other services are placed under the responsibility of a separate municipal department, the activities and costs associated with water and wastewater services should be separated from all other public services. The water sector revenues and costs should be reported separately to permit donors and lending agencies to determine the ability of the vodovod to maintain the investments donated or repay monies borrowed.
  - Provide assistance to the water and wastewater sections of existing “Komunalc” in setting up separate accounts for this portion of the municipal services.
- d. List the Cost of Service Taxes on Customer Bills as a Special Line Item All vodovods should consider listing all service-related (but not profit) taxes on customer bills as a separate line item to be collected as part of the water and wastewater bill. The vodovod could use this as a reminder to its customers of the impact on their bill of these taxes that are levied by various arms of the government.
  - The vodovods should be able to do this without assistance.

## **APPENDIX A**

### **REGULATIONS OF THE TUZLA BOARD OF DIRECTORS**

#### **Regulations of the Board of Directors (As Translated from the Vodovod' s Statutes)**

#### **Article VII. Management of Water Utility Company Competent Body**

##### **Article 18.**

The Board of Directors is hereby appointed as the body for management of the water utility company.

The Board of Directors shall consist of five members.

The Mayor of the Municipality shall appoint the members of the Board of Directors for a period of four years, but after their term expires, they may be re-appointed.

Two members of the Board of Directors shall be employees of the water utility company, as proposed by the director of the water company.

##### **Article 19.**

The Board of Directors shall perform the following tasks:

- Develop a business policy for the operations of the company
- Adopt long term plans for development, with approval of a competent body in the municipality
- Adopt short-term plans
- Make decisions about allocation of profits
- Make decisions about investments
- Adopt reports about the affairs of the company and approve annual reports
- Appoint the director of the company, subject to approval of the Mayor of the Municipality
- Adopt statutes or bylaws of the company, with the approval of the Mayor
- Issue documents about internal organization
- Issue other documents related to the affairs and business of the company
- Perform other activities that are defined by the law, and by the statutes of the company.

##### **Article 20.**

The Board of Directors shall make decisions by a majority of all members.

##### **Article 21.**

The President of the Board of Directors shall schedule meetings, but if he/she is absent, the senior member of the Board of Directors shall schedule meetings.

The Board of Directors shall make its decisions following discussion during the meeting.

## **Article 22.**

The manner of scheduling meetings, conducting discussions, voting in meetings, and other matters related to the work of the Board of Directors, shall be as defined in the Board of Director's Operating Procedures. The Board of Directors shall adopt these Operating Procedures.

## **Article 23.**

The employees of the company have the right to make decisions and to manage the company. These rights of the employees are specified in accordance with applicable laws, this Statute, and collective agreements.



## APPENDIX B

### PRIVATIZATION IN CELIC

#### Background

Formation of Celic as a New Municipality Before the war, Celic was part of Lopare Municipality. Following the Dayton Agreement, Lopare and Celic were divided into two municipalities. The former is now in Republika Srpska, and the latter is in the Federation. Celic suffered serious damage during the war, and its infrastructure was in poor condition. The new municipality decided to privatize all communal public services rather than try to assume that responsibility on its own, by awarding half the 12 communities to two separate companies.

Population The total population of the entire municipality is about 17,500. The principal town of Celic has about 6,500 people, and the other 11 villages range in size from about 650 to 2,500.

#### Municipal Decisions

The municipality appears to have used “decisions” as a means for awarding “contracts” for these management responsibilities, but the entire process was far from clear.

Basic Decision to Enter Into Management Contracts In a decision taken on 9 March 1999, the municipality agreed to transfer responsibility (but not ownership of assets) for the operation and maintenance of all communal services in Celic and five villages to one company, and for the other six villages to another company. The essence of the decision was to set forth the “Rights and Responsibilities of Both Parties” in contract language, summarized as follows:

- Art 1 Municipality transfers all rights, responsibilities and liabilities associated with operation and management of public sector assets to a private Company
- Art 2 The Company will provide the following services (list includes water and wastewater systems; solid wastes collection and disposal; septic tank pump-out; maintenance of roads, markets, public parks, the morgue, and traffic signs; transport and burial of deceased persons; maintenance of river channels, chimneys and cemeteries)
- Art 3 States that the rights and responsibilities mentioned in Article 1 are to be defined in a contract between the Municipality and the Company
- Art 4 Grants the Company the right to collect revenue for all public services described in Article 2
- Art 5 Obligates the Municipality to assign additional services other than those set forth in Article 2 (listed three services, but they seemed to be already under Article 2)
- Art 6 Grants the Company the right to shut off water supply for non-payment
- Art 7 Grants the Company the right to disconnect water supply to those illegally connected
- Art 8 Grants the Company the right to collect money for other public services in accordance with a plan (to be agreed upon later?)

Art 9 Requires the Company to submit reports to the Municipality every six months

Art 10 States that the Municipality will give donations to the Company for such activities described above to assist in improving services. States that any funds received from donors for these activities will be transferred to the Company. States that any vehicles or equipment given the Company by the Municipality will require a contract amendment

Art 11 To assist the Company, the Municipality will provide an employee to work with the Company one day per week

Art 12 This decision to be effective as of 3/09/98

Decision to Award Management Contracts Three days later, on 12 March 1998, the Municipality took another decision that selected the two companies to undertake this work. The decision stated:

Art 1 The Municipality agreed to award the projects to two companies for the “same price list” (presumably as stated in their proposals)

Art 2 “Trgotransped” is awarded the contract for Celic and five villages

Art 3 “Vrazici” is awarded the contract for the remaining six villages

Art 4 The two Companies are instructed to share responsibility for certain activities (maintenance of certain roads and the landfill)

Art 5 Trgotransped is granted the right to collect revenue from users

Art 6 Vrazici is granted the right to collect revenue from users

Art 7 Describes the priority activities to be undertaken

Art 8 This decision to be effective as of 3/12/98.

### **Management Contract**

The contract required under Article 3 of the 3/09/98 decision was never prepared by the Municipality, even though it was there responsibility to do so. The Owner and Director of Trgotransped said he has never signed any document with the Municipality. He said he and the mayor “work things out together” and they have an understanding that he has a two year contract from the period he started work on 1 April 1998. At the end of the two years, he may be re-appointed if the Municipality is satisfied with his work.

### **Competition for the Project**

In early 1998, the Municipality advertised in the Official Gazette requesting bids for the provision of water supply and solid waste collection and disposal. There were four responses. The Owner said he also added responsibility for maintaining parks and roads. The Municipality decided to split the work and his and another firm were selected. Later, they added still other communal services.

## **Experience and Qualifications of Trgotransped**

The name of the Company translates roughly as “trade” or “market economy”. Its owner, Mr. Mehmedalija Junuzovic, has a degree in business administration. He is a businessman, and was formerly the head of planning and marketing for several companies, including import/export services. He was also Deputy Mayor at one time. When asked why he decided to make a bid he said there were no other jobs available at that time, and so he decided to make use of some vehicles and workshops he owned.

## **Description of Sector Facilities**

Water Supply The Company is responsible for providing water to the 6,500 people in Celic town and a nearby village and another 2,700 in the remaining four villages. There are three water systems to serve them. It provides water to 5,000 people (76%) in Celic and the nearby village and 950 people (68%) in two of the villages. There is an incomplete system to serve some of the 1,300 people in the other two systems. The Celic and incomplete systems rely heavily on dug wells while the other system has springs. Water is said to be chlorinated. The water is sampled occasionally and the tests are reported to the Owner as “good” or “not good”. Lately, tests are mostly “not good”. Because of dry weather, systems provide only 700 m<sup>3</sup>/day at this time, down from 1,500 m<sup>3</sup>/day last fall. This deficiency in adequate sources of water prevents the Company from providing water for more than about 12 hours per day. All customers in Celic town are metered but none of them are functional now. There are no meters in the villages. There are 28 km of water mains, mostly AC and GI.

Wastewater There are only about 200 meters of sewer lines in the town, so essentially there is no effective wastewater collection system. As for septage or sludge from septic tanks, the Owner says the people are responsible for their own systems, and he pumps out tanks only when requested. He said most people dump the sludge on farmland. Article 2 of the 3/09/98 decision includes “Pump out septic tanks” as one of the Company’s responsibilities.

Administrative and Financial Situation The Company is located in a very small, two room building provided by the Municipality, with no indoor plumbing. The Company has 8 permanent and 5 temporary employees, and limited vehicles and equipment. The Owner stated that he has considerable difficulty in collecting revenues for the services billed, but their collection rate of about 60% is better than the 40% average for all ten vodovods surveyed, and second only to Banja Luka’s 82%.

## **Summary**

The Celic situation is an interesting experiment in private sector participation, but hardly serves as a model. The quality of services being provided is very poor, but probably would be little better if they were being provided by a publicly owned and operated vodovod.